

INDEX TO ADVERTISEMENTS

In the "Canadian Architect and Builder."

Architects.	Cements.	Mantels, Grates, and Tiles.	Revolving Doors
Ontario Directory... III	Owen Sound Portland Cement Co. III	Holbrook & Mollington	Revolving Door Co. ... v
Quebec Directory... III	The Rathbun Co. ... xv	Rice Lewis & Son. IV	Sash Cord.
Architectural Sculptors.	San Portland Cement Co. I	Mail Chutes.	Samson Cordage Works. iv
Holbrook & Mollington. i.	Oreosote Stains	Mouldings.	Slate
Architectural Iron Work.	Cabot, Samuel. 84	Decorators' Supply Co. iv	Steinberger, Hendry Co. vii
Canada Foundry Co. x	Canada Paint Co. iv	Mortar Colors and Shingle Stains.	Stained and Decorative Glass
Dominion Bridge Co. I	Door Spring	Cabot, Samuel. 84	Bloomfield & Son. v
Architect's Tools	Collidge & Bridgen. xii	Muirhead, Andrew. i	Henry. v
Thornton & Co. A G xiv	Drawing Inks	Meshing	Detroit Decorative Glass Co. 81
Artificial Marble	Wagner, Gunther. xii	Frost Wire Fence Co. IV	Camm, Thos. Wm. xii
Caron, E. 84	Elevators	Ornamental Iron Work.	Horwood & Sons, H. v
Blue Print Paper.	Fensom, John. I	Canada Foundry Co. x	Mackay Stained Glass Co. v
Hughes, Owens Co. iv	Otis Elevator Co. I	Dennis Wire & Iron Co. viii	McKenzie's Stained Glass Works. v
Bells and Clocks	Malloch & Co. IV	Ornamental Plaster	Queen City Plate Glass Co. v
Meneely & Co. 84	Parkin Elevator Co. I	Hynes, W J. xv	St. George, H. E. v
Warner & Sons, John xiii	Turnbull & Russell Co. V	Fredk Walton. xiii	Robert McCausland v
Bridges	Williams & Wilson. ... II	Painters.	Stained Glass Co. ... v
Canadian Bridge Co. 83	Engravers.	Montreal Directory. xvi	Sanitary Supplies
Dominion Bridge Co. I	Can. Photo-Eng Bureau. ii	Toronto Directory. ... xvi	James Morrison Brass Mfg. Co. xi
Builders' Supplies.	Fire-Proof Doors, Etc.	Patent Store Fronts	Johns & Co, Edward xi i
Luxfer Prism Co. ... xv	Smith-Warren Co. i	J. W. C ulson & Co. x	Shingles and Siding
Montreal Directory. xvi	Vokes Hardware Co. 81	Prisms.	Ormsby & Co., A B. I
Ontario Lime Association. xvi	Folding Partitions.	Toronto Plate Glass Co. viii	Roofers Supply Co. ... II
Rhodes, Curry & Co. v	Springer, O. T. II	Paints and Varnishes	Soll Pipe.
Robertson & Co. D. v	Grilles and Railings.	Bridgeport Wood Finishing Co. viii	Toronto Foundry Co. II
Rice Lewis & Son. IV	Dennis Wire & Iron Co. viii	Canada Paint Co. iv	Tubing and Fittings
Smith-Warren Co. ... i	Granite	Japanol Paint Co. ... vii	Richmond Conduit Co. iii
Toronto Directory. xvi	Brunet, Jos. vi	Muirhead, Andrew ...	Tiles.
Building Stone Dealers.	Heating.	Parquetry Floors	American Enameled Brick & Tile Co. ...
Amherst Red Stone Quarry Co. vi	Darling Bros. vii	Elliott & Son Co. viii	Craven, Dunnell & Co. xii
Amherstburg Stone Co. vi	Lucy, T. den Co. ... ii	Plate Glass	Holbrook & Mollington i
Credit Forks Stone Co. vi	Ives & Co. H R. ... ii	The Consolidated Plate Glass Co. II	Malkin Tile Works. xiii
Crookston Quarries. ... vi	Ormsby & Co. A. B. I	Toronto Plate Glass Co. vii	Permanent Decorative Glass Co. xii
Brooks & Son. vi	James Smart Mfg Co. xvi	Queen City Plate Glass & Mirror Co. v	Richards Tile Co. H. xiii
Hood & Son. vi	Interior Decoration	Plumbers	Stanley Bros. xiii
Kline John. vi	Elliott & Son Co. viii	Montreal Directory. xvi	Toronto Plate Glass Co. viii
Horsehoe Quarry. ... vi	Geo. Jackson & Sons. v	Toronto Directory. ... xvi	Wo. liscroft & Son. ... xii
Roberts n & Co. D. vi	Green Geo. E. i	Roofers	School and Church Furniture.
Roman Stone Co. 84	Richter Mfg Co. ix	Duthie & Sons, G. xvi	Globe Furniture Company. v
Silex Stone Quarries Co. vi	Landscape Architect	Douglas B. s. xvi	Can. Office & School Furniture Co. III
Sackville Free Stone Co. vi	Frederick G Todd. III	Forbes Roofing Co. xvi	Veneers.
Builders' Hardware.	Lime.	Hutson & Sons, W D viii	Imperial Veneer Co. IV
Batty Stove & Hardware Co. xi	Ontario Lime Association. xvi	Nicholson & C. , D. xvi	Wall Plaster
Rice Lewis & Son. ... iv	Robertson & Co. vi	Rennie & Son, Rcht xvi	Albert Mfg. Co. iii
Vokes Hardware Co. 81	Legal.	Ormsby & Co. A. B. I	Geo. Jackson & Sons xiii
Bricks	Quinn & Morrison. ... II	Ringham, George. ... xvi	Wire Lathing
American Enameled Brick & Tile Co. i	Laundry Machinery	Stewart & Co. W. T. xvi	The B. Greening Wire Company. III
Beamsville Brick & Terra Cotta Co. ... II	Troy Laundry Machinery Co. viii	Williams & Co., H xvi	Window Cord.
Don Valley Brick Works. 82	S mbling, Wm. H. ... 84	Rubber Tiling.	Samson Cordage Works. iv
Toronto Pressed Brick Co. III	York Mfg. Co. IV	Gutta Percha Rubber Co. iv	
Milton Brick Co. xi	Lighting.	Reflectors	
Contractors' Plant and Machinery	Best Street Light Co	Frink, I. P. III	
Rice Lewis & Son. ... IV	Lumber.	Roofing Material	
	Canada Wood Specialty Co. 81	Ormsby & Co. A B. I	
	Gilmour & Co. iii	Roofers Supply Co. ... II	
	Wilson Bros. 81	Rubber Stamps	
		Young Co., C G. 81	

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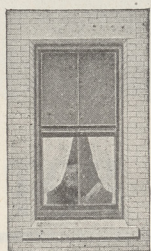
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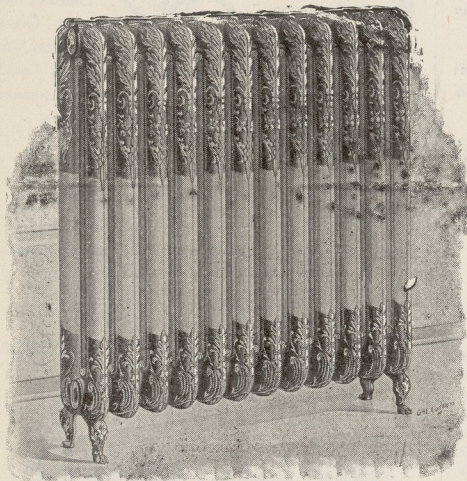
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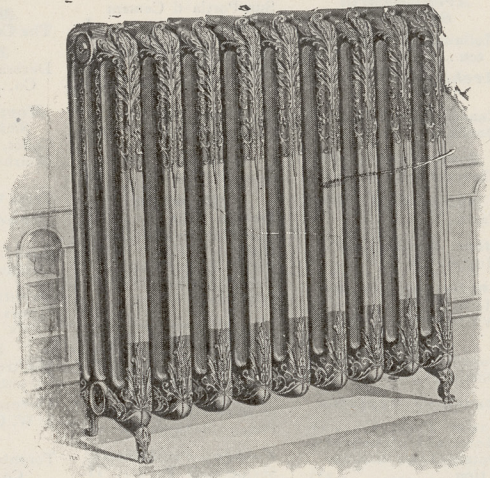
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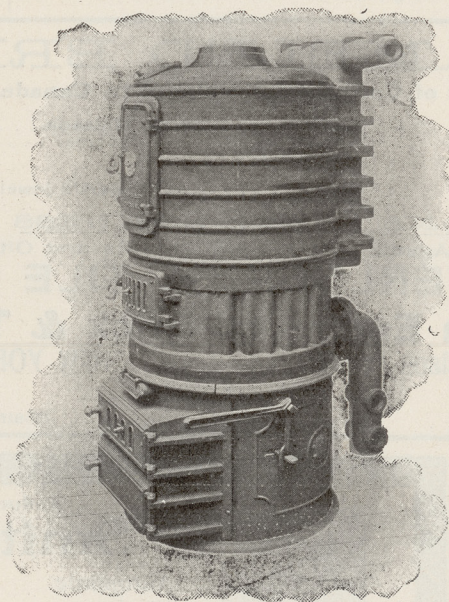
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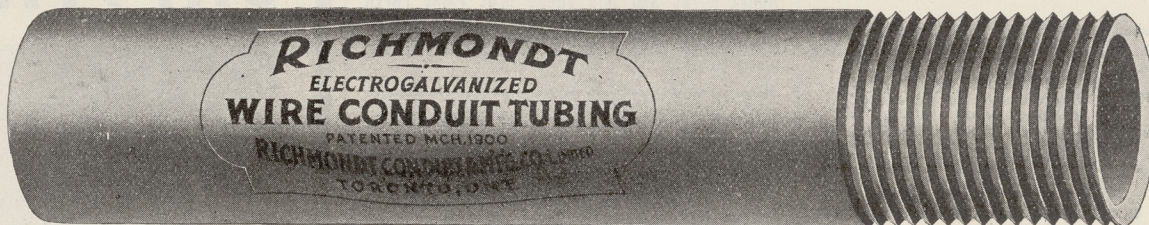


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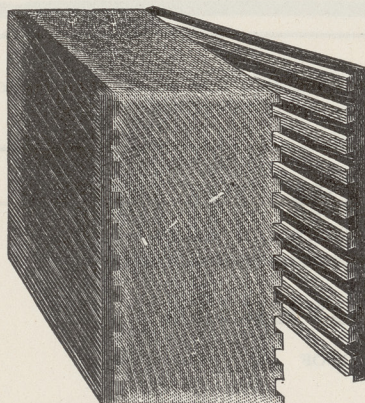
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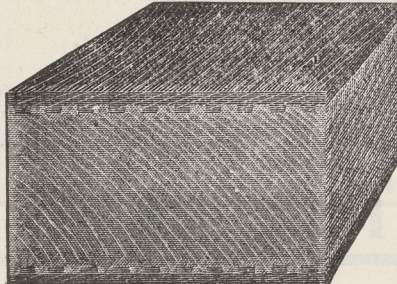
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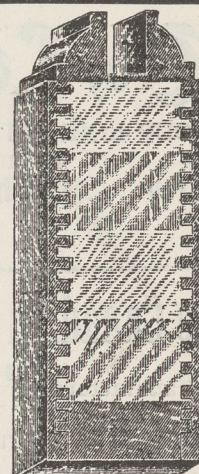


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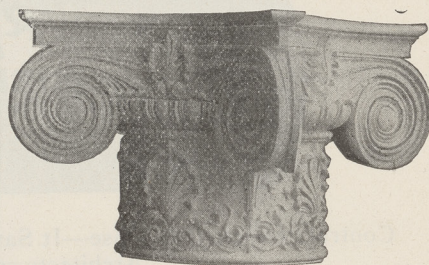
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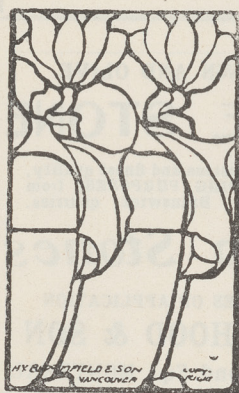
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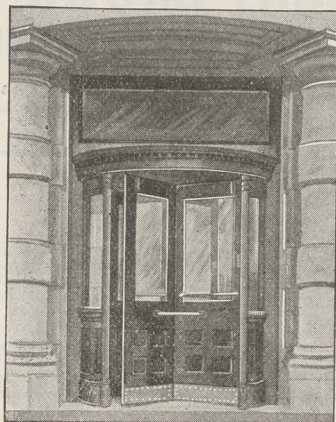
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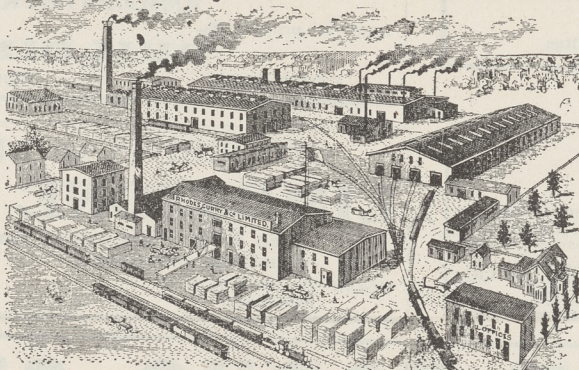
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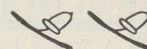
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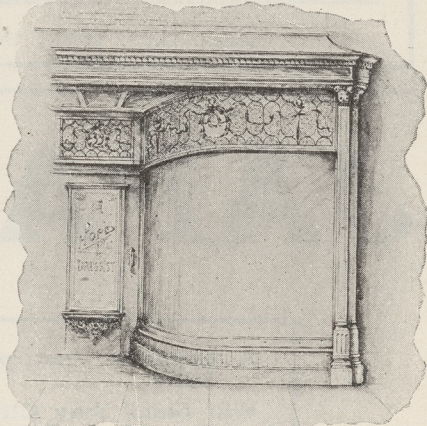
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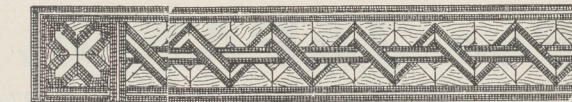
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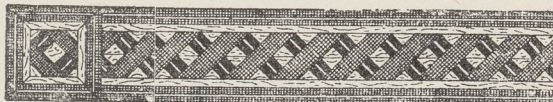
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The Canadian Architect and Builder

VOL. XVI.—No. 185.

MAY, 1903.

ILLUSTRATIONS ON SHEETS.

House in Prince Arthur Avenue, Toronto.—Bond & Smith, Architects.
Methodist Church at Windsor, N. S.—Elliott & Hopson, Architects.
Royal Bank of Canada, Sydney, N. S.—J. C. Dumaresq & Son, Architects.
Saint Mary's Church, Parish House and Rectory, Walkerville, Ont.—Cram, Goodhue & Ferguson, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECT'S EDITION.

The Allan Homestead, Moss Park, Toronto.
The Triumph of the Drama—Decorative Painting for Centre Panel of Proscenium Arch, Russell Opera House, Ottawa—By Frederick S. Challenger, R.C.A.

CONTENTS

Editorial	69-70	Fresco Paint	78
Apartment Life	71	A Masonry Estimate Table	79
Fireproof Floor Construction	72	Some Causes of Paint Peeling	79
"Slip-Shod Tendering"	72	Lowering a Tall Flagstaff	80
A Possible Solution of the Sky-Scraper Question as Bearing on the Subject of City Hygiene	72	Legal	80
By the Way	73	Proposed Technical Institute for Montreal	81
Heat Resistance of Building Materials	74	Notes	83
Northwest Letter	75	O. A. A. Examinations	84
Intercommunication	76-77	Tests of Materials	84
German Practice in Chimney Construction	78	Painters and Decorators Convention in Toronto	84
To Mark Boards into Two or More Equal Widths	78	Fixing Tiles	84

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Scarcity of Slate.

Unusual activity in building construction coupled with difficulty in securing skilled quarrymen are believed to be the principal causes of the present scarcity of roofing slates. Scarcity of skilled labor in this line also prevails in Wales, so that no workmen can be imported with which to extend operations on this side the Atlantic. The past winter is said to have been an unfavorable one for slate quarrying operations, frequent thaws and rains causing the loss of large quantities of material. If the necessary labor can be obtained this should be a favorable time for the development of the extensive slate deposits in Newfoundland, as prices are said to be higher than at any period during the last twenty years.

The Colonial Style Run Riot.

We are pleased to note the tendency in the United States to substitute for the Colonial style in domestic architecture; half-timber and other forms of construction following closely the best English examples. The supremacy of English house and church architecture cannot be doubted, while the so-called Colonial architecture of these days has become an abomination. In some of the newly built up residence districts of Toronto and other Canadian cities may be seen whole streets of houses, the fronts adorned with porches and verandahs of the so-called Colonial style, each being an exact duplicate of all the others. The effect is monotonous in the extreme, and the person who is obliged to look on these houses day after day learns to abhor white porches

and verandahs. True, these serve a useful purpose in our climate, but why should there not be variety in design and material, thus imparting to them individuality and interest? Of course they could not then be designated Colonial, but they would be none the worse for that.

Protection of Buildings from Lightning.

The Committee of the Royal Institute of British Architects and the Surveyors Institute appointed two years ago to investigate the subject of the protection of buildings from lightning, expect to present their report at the close of the present year. Meanwhile some details have been given out of the reports already sent in by the committee's observers. These contain a list of sixteen protected buildings struck by lightning and more or less seriously damaged, including a considerable number of churches, light-houses and factories. One of the most interesting cases so far reported, and one which seems to show that the so-called protectors sometimes tend to induce lightning stroke, is that of a large country house in Sussex, erected some twenty-eight years ago, and till recently without any form of protection. In 1901 a church in the immediate neighbourhood having been struck, the owner of the house, for greater security, decided to have lightning rods put up. An elaborate system was installed and completed in March, 1902, nearly every portion of the building having its own finial and conductor. During the storm season of last year the house was twice struck—on June 17 and

THE CANADIAN ARCHITECT AND BUILDER

August 8. On each occasion, besides other injuries a chimney stack was damaged, the brickwork being split up and the capping-stones dislodged and hurled about in all directions. The lightning-rods on the damaged chimneys were torn from their supports and much bent. Careful study will be given by the Committee of all the cases reported, and an effort will be made to suggest better methods of protection than those at present employed.

Over-Production of Cement.

The losses arising from over-production in the manufacture of Portland cement in Great Britain and Germany have already been alluded to. From data recently published it appears that in Russia from the same cause the industry has also become unprofitable. Until 1896 there was only one cement factory in Russia, the Black Sea Company, a German concern, at Novorossik, with a yearly output of 30,000 barrels. Two years later owing to increased demand, there were eight factories. In spite of the fact that the consumption of cement rose from 469,000 barrels in 1896 to a million and a half barrels in 1901, the rapid increase in manufacturing capacity forced prices down in 1900 to a point where the older factories paid no dividends and the newer ones suffered heavy losses, and in some instances were obliged to go out of business. Efforts are now being made to put the industry on a paying basis by forming an association of the manufacturers to control prices and by manufacturing at home the cement casks which heretofore have been imported from Poland. There is a lesson in all this for the present manufacturers of cement in Canada and more especially for persons who contemplate engaging in the business. The manufacturing capacity in this line has increased very rapidly in Canada within the last five years, and has almost if not quite reached the safe limit. Notwithstanding the greatly increased demand of late for cement for construction work in which other materials were formerly employed as well as for new uses, manufacturers of cement should take warning by the experience of the countries we have mentioned, and be careful not to let the supply outrun the normal demand.

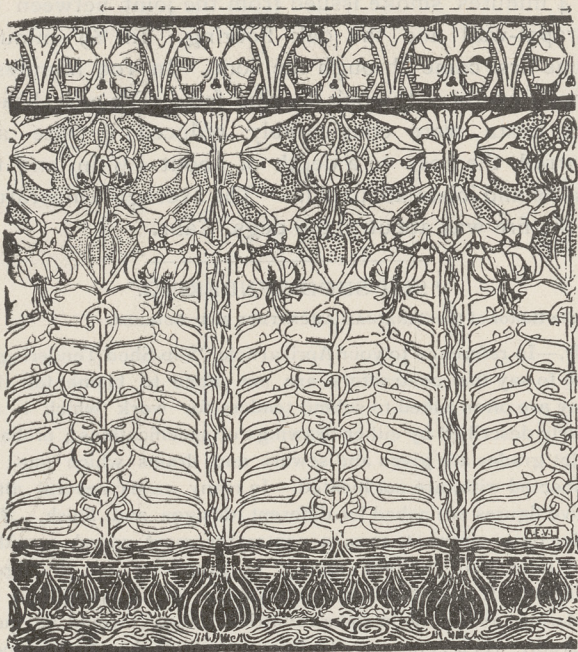
Defensive Methods of Employers.

There is a growing disposition among employers of skilled labor to co-operate with each other in resisting the ever growing and intolerant demands of organized labor. It is beginning to be understood that if employers are to have any rights whatever or any control over the businesses to the building up of which their capital and best efforts have been devoted, they must stand together and support one another in a more determined manner than they have done in the past. The benefits of such co-operation received illustration recently in one of the smaller cities of Western Ontario. The union workmen in the employ of a contractor struck work because some fault had been found with them. They were aware that building mechanics were being advertised for by some of the other local contractors who were expected to welcome them. Their former employer, however, advised his fellow contractors by telephone of the circumstances of the case, and when the strikers applied for employment they were invariably met with the reply that no help was required.

This had the effect of reducing their arrogance and they returned to work. Another case was that of the Penberthy Injector Co., of Detroit, to whom the alternative was presented by the Brass Workers' Union of discharging a non-union workman or contending with a strike. The Penberthy Co. brought the facts to the attention of the principal manufacturing firms of the city, forty-seven of which met and passed a resolution asserting the equal right of every man to employment, and pledging their support to the Penberthy Co. in resisting the unjust demands made upon them. It is understood that a movement is now on foot having for its object the organization of employers of labor throughout the province of Ontario.

No Outside Interference.

A strong protest has recently been entered in several quarters against interference with and control of Canadian labor organizations by the leaders of the International Unions of the United States. Archbishop Bruchesi recently caused to be read a pastoral letter in all the Roman Catholic churches of Montreal, urging Catholic workmen to keep clear of entangling alliances which would make them subservient to the mandates of foreign organizations having little knowledge or sympathy with the conditions existing between employers and employes in this country. The letter goes on to say: "Calmness and reflection will make you realize that there are just limits to your demands. You cannot reasonably expect that the workingman's wages will be ever on the increase, and that at the same time the hours of labor will decrease proportionately." In the Senate at Ottawa a discussion recently took place on this subject in connection with a Bill to amend the Criminal Code respecting offences connected with trade and breaches of contract. Hon. William Gibson was not opposed to labor unions per se, but objected to foreign dictation. He referred to a case in Hastings County where a company was wiped out by a strike ordered from Washington. Almost every labor union was directed from Washington. He advocated prohibiting international unions. They would effect settlements more easily, and have fewer strikes. He hoped the bill would be made so that they could indict the lodges. He read a letter received on May 17 from the Beamsville branch of the Journeymen Stonecutters' Association of North America, demanding \$3.50 a day for nine hours. The letter went on: "We have been notified by the Niagara Falls branch not to send stone into their jurisdiction." He was not only told what he was to pay the men, but that he must not cut stone to be used in another jurisdiction. He hoped the bill would be enlarged, so as to make the men amenable to the law, and strike at the root of the matter. Hon. James McMullen said if Canadian labor organizations were to be controlled from the United States, Canadians would be unable to take contracts, because they did not know when a strike might be ordered. If some American institution was desirous of crippling a competitive institution here, all they had to do was to approach the head center, tip them the wink, point out how a service could be rendered. A strike would ensue, and the Canadian owner would be the loser. He was surprised at the attitude of the press. There did not appear to be a paper in Canada that had the courage to come out boldly on this question.



DADO DESIGN BASED ON LILIES. FROM "PLANT FORM AND DESIGN."

APARTMENT LIFE.

The growth of the apartment idea is not an unmixed gain. There are few more important words in the English language than the word "home," and it is about to acquire but a modified meaning to those persons who intend to adopt a life in the apartment houses that are beginning to rise in our big cities.

Home is a place which shuts off the world at the street door; a place must be separate, self-contained, and in some sense our own to give properly the feeling of home; and an apartment is these things only in a modified sense. It is little more separate or self-contained than a suite of rooms in a boarding house would be; and proprietorship in an apartment, even if held by purchase, cannot compare with the proprietorship which extends down to the ground and includes some portion of it. A lodging in the air is not perfectly a home "barring you're a bird."

In the second place, though home to be home must shut its inmates off from the world, it must also, for people of refinement, provide for their separation from one another. The essence of house planning is in the effort to keep functions and people apart. The upstairs and downstairs arrangement of a house gives a definiteness for this purpose which one never realizes so clearly as when looking over a "flat." On a level, particularly when, as so often happens, it is made necessary to pass all the bedrooms on the way from the entrance to the living rooms—privacy is more difficult. A delicate woman, who wishes to lie down during the day, imposes restraint on all the inmates; or else becomes accustomed to less consideration than she would receive in a house. There is too great nearness of the inmates as a matter of feet and inches, and this is likely to result in too little distance in the matter of relations with one another. A delicate woman is apt to become an indelicate woman in the matter of appearances in dishabille, which the comparative privacy given by the different levels of a house should prevent.

The ideas of home and family are closely connected, but what is to be done with children in a flat? There is no upper room where they can play and make as much noise as they like; nor is there likely to be any ground outside, and if there is it is public ground.

This is not the same thing as ground, however small, apart from the rest of the world, where children can have room for their own numerous private affairs. A very simple habitation, if it has room for these, will, to a family of children, be dignified by all the sentiments which home inspires; sentiments which make childhood a memory and prepare the way for the domestic and patriotic ideas with which it is so important that the manhood and womanhood of a nation should be possessed. Large families are in themselves the making of a home; but what is to be done with a large family in a flat? What was always a troublesome joy is likely to preponderate so much on the side of trouble as to cease altogether to be a joy; and then there is danger of its ceasing to be at all. The happiness of a woman does not seem to consist now as it did in the early days of the world, in being the mother of children. Domestic life has ceased to be to her her necessary field of work. Men, much as they hate work, do seem to acquire a sort of enthusiasm for the proper fulfillment of it; it is their life. But women seem not to regard domestic duties as their life, but as an irksome addition to their life. Their confabulations about it have a tone of discontent. They incite one another continually to desire greater freedom from care. The woman who is most envied is she who has the least care. Not only is pride in their families vanishing but pride in their housekeeping as well; and apartment life will complete the process. With no families and almost no housekeeping—for, with soup in paper boxes and fried potatoes in a bottle, a woman has little to think of now if she has credit and a telephone—with nothing to do at home, women may fulfil their ideal; but will they not also fulfil the warning of St. Paul and "learn to be idle, wandering about from house to house; and not only idle, but tattlers also and busybodies, speaking things which they ought not."

It is pertinent to enquire whether the solution of the housing question, most suited to our national traditions and character, does not lie in radial railways, that will enable us to keep touch with the town while spread over the country, rather than in a system of housing that will pack us, six or eight families deep, over so much land only as is comprised within the area of a concreted cellar.

The essence of the question is in reality the necessity of giving children an opportunity for outdoor life at home. Playing grounds are all very well as a remedy, but we should avoid the extremity that requires them. It has long been a subject of lamentation that the poor and the children of the poor should live and play on the street; it will be lamentable indeed if the children of the comparatively well to do are brought to the same condition. This extreme as well as the other is exemplified in New York, and should furnish a warning to aspiring cities. In New York, a long way up, in the Harlem neighborhood, the streets on which the residential flats are built are full of respectably dressed children; running about in the road among the horses, sitting on the dirty sidewalk, playing ball over the heads of the passers by. One receives an impression that they have just got out of school and are lingering before going home. The discovery that they have got home, that this is their home, gives a shock when it is first realized. All the streets in the neighborhood exhibit the same state of things. A little investigation

shows that it is unavoidable. A popular flat, only six storeys high, with a hundred feet of frontage; inhabited by married people chiefly, clerks of some standing; a lawyer or so, a couple of doctors, and people of that sort; shows on its plan but scanty accommodation for children. Most of the apartments have one bedroom or two; none have more than three. Yet, when the rooms available for children are counted up, there appears without squeezing, and there must be a good deal of squeezing done in these apartments—possible room for fifty children. Across the road there is an apartment building of similar size, and others all along the street. This simply means that the children in that street might line both sides of the road; that, if they all played at home, the hundred running feet of street in front of the apartment building examined might have to suffice for the playground of a hundred children. It is not likely there are so many; but that is an evil on the other side, for there ought to be twice as many. It looked a miserable state of affairs. "Boys" John Boroughs says "live in a world that is inhabited entirely by boys;" but the boys in these streets must have another view of life thrust upon them, and perhaps this may have something to do with the elderliness of the American boy, about which his fellow countrymen sometimes complain.

There seems to be a tendency to hail the advent of apartment house building as a solution of every difficulty; but there is evidently something to be said on the other side. If they were regarded only as a final necessity; as something to be avoided as long as there is any other way of convenient housing; it would probably be nearer the truth, and we should turn our attention first to what is more really a development of our own times—the application of the means of rapid transit to enable men who work in the city to live in the country where land is cheap.

W. A. LANGTON.

FIREPROOF FLOOR CONSTRUCTION.

Mr. Frank Caws, F.R.I.B.A., recently gave an address on "Fireproof Floor Construction" before the Edinburgh Architectural Association. Referring to the modern use of Portland cement and iron in floor construction, Mr. Caws said that generally speaking the introduction of steel girders as supports for the concrete has been carried to a very unwise excess, inasmuch as the action of fire upon the steel, causing it to expand, made it most injurious to the concrete floors, and, instead of being a support, it proved in such cases the means of their destruction. Therefore, he advocated a method of constructing floors in large slabs of concrete, with a minimum amount of steel bearers, so disposed and protected from the fire as to give the necessary support without introducing an element of weakness. In this connection the results have been published of a test of two hours duration in October last by the British Fire Prevention Committee of a floor of fire supports and oak flooring. The floor was 22ft. 3in. by 10ft. in the clear, and consisted of two 10in. by 12in. beams of yellow fir placed across the testing-hut, with four 10 in. by 10 in. joists notched into them at 2 ft. 6 in. centres, oak boards 8½ in. wide and 2½ in. thick being spiked on top; a 15 in. by 15 in. yellow fir post supported the floor in the centre. The floor was loaded with 232 lbs. to the square foot, distributed.

In 4 minutes smoke issued from the joint between the parapet-wall and the oak flooring. In 89 minutes flame first came through the floor. In 109 minutes a small portion of the oak flooring fell. The post, beams and joists were considerably reduced in size and charred, the post to a depth of about 1¼ in. and the beams and joists about 2 in. The average temperature of the fire was about 1,400 degs. Fahr.

"SLIP-SHOD TENDERING."

To the Editor of the CANADIAN ARCHITECT AND BUILDER:

Sir,—In reference to your April article "Slip-Shod Tendering," I wish to say that contractors are not alone to blame for this. They are often asked to submit tenders for work which is not clearly described by either drawings or specifications; probably no lot grades are given and sewers and drains which must be connected with, are not located. In many cases several alternative figures are asked for different designs and finish. Now under these circumstances, a contractor must spend considerable time and perhaps money in preparing an intelligent estimate. If quantities were supplied him or compensation for tendering, as is done in some countries, the case would be quite different. As it is however he frequently finds that he has spent his time (which is the same as money to most contractors) for nothing, not even a chance for the job, which either does not go on at all or goes to a previously selected builder, estimates being asked for simply to set the price.

In my opinion these are some of the reasons why contractors are tempted to do so much guessing and why this will continue until such time as both architects and builders are organized to that extent that they can compel clients to pay a fair price for valuable information.

An architect should be competent to estimate to within 10 per cent. of the cost of most buildings; close enough at least to enable his client to decide when and what to build. To call upon perhaps a dozen busy men to give their time gratis to help to decide these points is scarcely honest.

Yours truly,

A. C. C.

VANCOUVER, B. C., May 18, 1903.

A POSSIBLE SOLUTION OF THE SKY-SCRAPER QUESTION AS BEARING ON THE SUBJECT OF CITY HYGIENE.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—Mr. Langton's pertinent treatment of the question of "High Buildings" in your last issue leads me to suggest a possible way out of the dilemma might be for Manhattan and other cities to legislate in a way to limit them to two out of every three of the buildings forming the line of the street tenements.

Two tall buildings could thus adjoin each other—the lots supposed to be some 25 to 30ft. frontage, more or less—leaving a space between for light and air. In this way each of the taller structures could have windows along one side or party wall of the building. This would form a not objectionable crenelated series of tenements; the vertical protuberances starting from above the 5th, 6th or 7th story of the row of structures, according to width of street, as along the Paris boulevards, with a continuous cornice or entablature at that height.

Each proprietor of a high building adjoining the lower structure, should be bound to equalize advantages by making over to the proprietors of the low or stunted block, one-third of the net profits derivable from the upper stories of the higher structures after duly allowing for interest on net cost thereof, and other charges considered fair in the premises.

CHAS. BAILLAIRGE, C. E., Quebec.

Professor Ramsey, in a lecture at Carpenters' Hall, London, said that it is a common practice to attempt to hasten the drying of new buildings by leaving the doors and flues open, but he thought it would be more rational to close these vents, and to use charcoal braziers in the closed rooms. The hot gaseous carbonic acid evolved from the burning charcoal would flow through the walls, and the carbonic acid would materially accelerate the conversion of the lime in the mortar into carbonate of lime; the passage of the hot carbonic acid through the walls would not only dry out the water, but would increase materially the rate of conversion of the lime into carbonate of lime.



WATER-LILY STENCIL FOR WALL HANGING. (FROM "PLANT FORM AND DESIGN.")

BY THE WAY.

The latest specimen of "tinsel" architecture, of which alas! there are already too many examples, is reported from California. The builder of a frame house is said to have applied to the exterior while the paint was still wet, a rough-casting of sand and fine blown glass.

x x x

The purchaser of a furnace sued the manufacturer to recover the price, alleging that the furnace would not perform the guaranteed duty. In proof that the furnace was a poor heater he cited the fact that while it was being run to its full capacity, a barrel of beer placed on top of it had frozen.

x x x

A factory is to be established at St. Mary's, Ont., for the manufacture of Portland cement. The intention is to use in the process crushed limestone instead of marl. The promoters of the enterprise claim that by this means the cement can be produced more cheaply than by the method now employed.

x x x

George Ley, whose luck at cards was proverbial, resolved to build his residence at Combe Martin, North Devon, England, in the form of a pack of cards, split up and erected castlewise. The idea was carried out thoroughly and the edifice equipped with fifty-two windows—one for each card—while its form necessitated a plethora of chimney stacks.

x x x

The visitor to Washington is delighted with its clean streets, its extended boulevards, resembling those of Paris, and its magnificent public buildings, especially the Capitol, the Art Gallery and the Congressional Library. The latter with its beautiful mural decorations is alone worth many hundred miles of travel to see. The domestic architecture of Washington, with few exceptions, is however, the most commonplace of any that I have visited in the United States. We have been accustomed to believe that a few good examples of architecture placed about a city must tend to leaven the whole architectural lump. If that be true, Washington must be regarded as the exception which proves the rule.

x x x

It is reported that Mr. Flavelle's handsome house in Queen's Park, Toronto, is likely to be purchased by the Ontario Government as a place of residence for the Lieutenant-Governors of the province. The house and its surroundings would seem to be well adapted to the purpose. If this change of location of the governor's residence be made, the City Council of Toronto should purchase for park purposes the present government house and grounds. The building, although somewhat

out of date, appears to be in a fair state of preservation, and could be put to some public use, as for instance a museum. The grounds have been carefully kept, and contain some fine trees. They would give a pleasant breathing spot in the center of the city, the lack of which is becoming more acutely felt as population increases.

x x x

Surgeon-Captain K. Tamura, of the Imperial Japanese Army, in a recent address to the military surgeons of the United States, called attention to the use of paper for windows in Japan, in place of glass. He referred

to the fact that where no ventilation can take place through glass, the air passes through the paper quite freely. Moreover, the texture of the paper is such that, while admitting the air, it prevents in some degree the passage of germs through it. This point was determined by counting the number of colonies of bacteria developed on media inside and outside the house. It was thus found that 97 per cent. of the bacteria of the air were removed. The speaker summed up in the adroit Oriental way: 'It is well known that a citizen of Paris inhales 7,500 bacteria germs in a day; one in Berlin, 5,000 of them. We Japanese, who live in air containing three times as many as Berlin and twice as many as Paris, inhale only 2,000 bacteria germs in a day, simply because we use paper for the windows of our homes.'

x x x

"Punch" in the following lines depicts the sorrows of the professional man who is regarded as being either too young to be trusted or too old to be efficient:—

Two men there dwelt upon a time
Within a certain city.
Both were distinctly men of parts
Well versed in their respective arts.
To fell diseases of the kind
That everyone who can shuns
One of the pair had turned his mind,
The other's forte was mansions.
They were, as you'd no doubt expect,
A doctor and an architect.
The latter, when but twenty-nine,
Planned a Titanic building,
A house of wonderful design,
All marble, stone and gilding,
Said he: "My fortune's made, I wis,
Men can't resist a thing like this."
With eager hope his heart beat high,
He took his plans up boldly,
And thrust them in the public eye:
The Public viewed them coldly.
"Pray take that rubbish right away,
You're far too young for us," said they.

The doctor's was a novel treatment for consumption, but the public sternly rejected it also—

Apparently you quite forget
That you are barely thirty yet.

The years rolled on,

And then—the Public changed their mood!
Their hearts began to soften.
They felt the doctor's cures were good;
(They'd had that feeling often).
They also chanced to recollect
The merits of the architect.
"Come plan us mansions, bring us pills."
Their cry no answer rouses.
No one alleviates their ills,
No one designs them houses.
Upon enquiry it appears
Each has been dead for several years.

On April 26th the feast day of St. Mark, the Count of Turin, representing the King of Italy, laid the corner stone of the New Campanile at Venice in the presence of 30,000 spectators.

HEAT RESISTANCE OF BUILDING MATERIALS.

At the recent meeting of the American Society of Mechanical Engineers a paper was presented by Mr. William Kent proposing the use of the reciprocals of the values of heat conductivity of substances in order to facilitate the comparison of different combinations of the substances. As stated in the report of the convention, he makes the coefficient of heat resistance or heat insulating power of a substance equal to unity divided by the number of British thermal units transmitted in one hour by a slab 1 square foot in area and 1 inch thick per degree Fahrenheit of difference of temperature between the two faces of the slab, both surfaces being exposed to still air. In this way the total resistance of a combination can be indicated by the addition of the several resistance coefficients. The author points out, however, that while the coefficient is thus a constant quantity for a given substance, it can only be so considered when the differences in temperature of the air on the two sides of the slab are small—say, less than 100 degrees Fahrenheit. When the temperature range is great, experiments on heat transmission indicate that the quantity of heat transmitted varies not directly as the difference in temperature but as the square of that difference.

The question of the effect of surface resistance when the surface is in contact with air or with another body, the author treats as follows: "Authorities on the subject of heat transmission generally agree that the resistance to the passage of heat through a plate consists of three separate resistances; viz., the resistances of the two surfaces and the resistance of the body of the plate, which latter is proportional to the thickness of the plate. It is probable also that the resistance of the surface differs with the nature of the body or medium with which it is in contact. Thus a very rough surface on a metal plate would be likely to transfer more heat to adjacent air than a smooth surface would, since it has a greater area in actual contact with the air, while two rough surfaces of metal touching each other would transmit from one to the other less heat than two smooth surfaces."

He has computed the figures for heat resistance of several insulating substances from the figures of conducting power given in a table published by Mr. John E. Starr, in a paper on "Insulation for Cold Storage," published in "Ice and Refrigeration" for November, 1901. Mr. Starr's figures are given in terms of the British thermal units transmitted per square foot of

surface per day per degree of difference of temperature of the air adjacent to each surface. The author's figures, the coefficients of heat resistance, given in the second column of the accompanying table, are calculated by dividing Mr. Starr's figures by 24, to obtain the hourly rate, and then taking their reciprocals.

"Analyzing some of the results given in the last column of the table, we observe that, comparing Nos. 2 and 3, 1 inch added thickness of pitch increased the coefficient 0.74; comparing Nos. 4 and 5, 1½ inches of mineral wool increased the coefficient 1.11. If we assume that the 1 inch of mineral wool in No. 4 was equal in heat resistance to the additional 1½ inches added in No. 5, or 1.11 reciprocal units, and subtract this from 5.22, we get 4.11 as the resistance of two ⅞-inch boards and two sheets of paper. This would indicate that one ⅞-inch board and one sheet of paper give nearly twice as much resistance as 1 inch of mineral wool. In like manner any number of deductions may be drawn from the table, and some of them will be rather questionable, such as the comparison of No. 15 and No. 16, showing that 1 inch additional sheet cork increased the resistance given by four sheets 6.67 reciprocal units, or one-third the total resistance of No. 15. This result is extraordinary, and indicates that there must have been considerable differences of conditions during the two tests."

HEAT CONDUCTING AND RESISTING VALUES OF BUILDING MATERIALS.

Brick Wall :	Thickness.	Cond.	Res.	—Revised.—	
				Res.	Cond.
4-in.	0.68	1.47	1.50	0.667	
8-in.	0.46	2.17	2.30	0.435	
12-in.	0.32	3.03	3.10	0.323	
16-in.	0.26	3.85	3.90	0.256	
20-in.	0.23	4.55	4.70	0.213	
24-in.	0.20	5.00	5.50	0.182	
28-in.	0.174	5.75	6.30	0.159	
32-in.	0.15	6.67	7.10	0.141	
36-in.	0.129	7.75	7.90	0.127	
40-in.	0.115	8.70	8.70	0.115	
Wooden beam construction, planked over or ceiled :					
			Cond.	Res.	
As flooring.....			0.083	12.05	
As ceiling.....			0.104	9.71	
Fireproof construction, floored over :					
As flooring.....			0.124	8.06	
As ceiling.....			0.145	6.90	
Single window.....			1.030	0.97	
Single skylight.....			1.118	0.89	
Double window.....			0.518	1.93	
Double skylight.....			0.621	1.61	
Door.....			0.414	2.42	

The author has also calculated the coefficients of heat resistance from the heat transmission figures of various building materials, as given by Mr. Alfred R.

HEAT CONDUCTING AND RESISTING VALUES OF DIFFERENT INSULATING MATERIALS.

	Conductance.	Resistance.
1. ⅝-in. oak board, 1-in. lampblack, ⅞-in. pine board (ordinary family refrigerator).....	5.7	4.21
2. ⅞-in. board, 1-in. pitch, ⅞-in. board.....	4.89	4.91
3. ⅞-in. board, 2-in. pitch, ⅞-in. board.....	4.25	5.65
4. ⅞-in. board, paper, 1-in. mineral wool, paper, ⅞-in. board.....	4.6	5.22
5. ⅞-in. board, paper, 2½-in. mineral wool, paper, ⅞-in. board.....	3.62	6.63
6. ⅞-in. board, paper, 2½-in. calcined pumice, ⅞-in. board.....	3.38	7.10
7. Same as above, when wet.....	3.90	6.15
8. ⅞-in. board, paper, 3-in. sheet cork, ⅞-in. board.....	2.10	11.43
9. Two ⅞-in. boards, paper, solid, no air space, paper, two ⅞-in. boards.....	4.28	5.61
10. Two ⅞-in. boards, paper, 1 air space, paper, two ⅞-in. boards.....	3.71	6.47
11. Two ⅞-in. boards, paper, 1-in. hair felt, paper, two ⅞-in. boards.....	3.32	7.23
12. Two ⅞-in. boards, paper, 8-in. mill shavings, paper, two ⅞-in. boards.....	1.35	17.78
13. The same, slightly moist.....	1.80	13.33
14. The same, damp.....	2.10	11.43
15. Two ⅞-in. boards, paper, 3-in. air, 4-in. sheet cork, paper, two ⅞-in. boards.....	1.20	20.00
16. Same, with 5-in. sheet cork.....	0.90	26.67
17. Same, with 4-in. granulated cork.....	1.70	14.12
18. Same, with 1-in. sheet cork.....	3.30	7.27
19. Four double ⅞-in. boards (8 boards), with paper bet. three 8-in. air spaces.....	2.70	8.89
20. Four ⅞-in. boards, with three quilts of ¼-in. hair bet. papers separating boards.....	2.52	9.52
21. ⅞-in. board, 6-in. patented silicated strawboard, finished inside with thin cement.....	2.48	9.68

Wolff, based on German experiments. These values are reproduced in a table herewith, the first column giving the conductance, in British thermal units per hour, and the second, the reciprocals, or heat resistances. It will be noted that there is an irregularity of the differences in the value of the resistance for each increase of 4 inches in thickness of brick walls, which the author holds to indicate a difference in the conditions of the experiments. He finds the average difference is 0.80 and that the approximate formula for the resistance is $0.70 + 0.20 t$, in which t is the thickness in inches. In the third and fourth columns are given the revised values of the resistance and conductance, respectively ascertained in accordance with his formula.—Engineering Record.

NORTHWEST LETTER.

WINNIPEG, MAY 11, 1903

The open spring this year has been most favorable for building of all descriptions and has allowed the work to get under way considerably earlier than last year. Excavations, large and small, can be seen everywhere from the centre of the city to the outlying districts in the suburbs, and everything is activity in the building line. Some of the foundations of the smaller work have already approached the ground level and where the building is frame many are well covered in.

Before taking up the new work it would be in order to mention the two or three large works that were started last year and are now at the point of completion.

The Strathcona Apartment Block is the most noteworthy in this list. It is a building that will be welcomed by the great class who live in "Rooms". The population of Winnipeg has increased so during the past twelve months that house accommodation has become a most serious question and one that is already having an adverse effect on incoming residents and resulting in temporary detriment to the city. The opening of the Strathcona will therefore be heralded with delight by a host who at the present moment may be living more or less like sardines in a box. It will relieve the pressure in this direction to some small extent, but will not in any way settle the important question of housing. Winnipeg is a most favorable place for apartment buildings as the population for the most part is a very transient one and buildings of this description are ensured financially as being a most paying investment. To describe the Strathcona building is not a very serious undertaking as everything inside and outside has been carried out in the most simple manner. The building is constructed of the common gray brick, it is four stories in height with a high basement. On plan it is a square with a large centre court. From this court is arranged an entrance in each corner to the building proper which divides the whole into four separate parts. On the ground floor, first floor, and second floor each part is divided into two suites of from six to eight rooms with bath room accommodation for each suite. The finish of the main portion on ground and first floors is in oak and on the second floor maple. The top floor is reserved for bachelors' quarters and divided into separate and double rooms. What appears to be an omission especially in a building of this description is the lack of a passenger elevator, but in the planning of the work it may have been found undesirable. The use of metal ceilings throughout is a feature that strikes one as being most objectionable, and one that would not be tolerated in a very ordinary residence.

St. Mary's Academy is another building that was started last year and will be completed in the course of a couple of months. This building has apparently been designed with the object of getting the most accommodation for the least amount of money. Externally, the work is so extremely simple and the lines so hard that the general effect is most disappointing and a crudity in design pervades the whole work. Inside everything has of necessity been kept as simple as possible and even the Chapel, which in these Institutions is generally made a special feature is, from all appearances, being treated in keeping with the rest of the work. The tenders for this building were originally much in excess of the anticipated cost and consequently everything had to be reduced to the simplest form.

St. Stephen's Church, although not yet complete, will from

present indications be one of the most interesting Churches in the City. It is faced with Tyndall stone throughout and makes a very substantial looking block. The Sunday School forms part of the same building and the uninitiated on entering is much surprised at the small area of the body of the church. This of course may not have the same effect when the seats, etc., are arranged in position. The Church will be open for service in the course of a few weeks.

Of the new work already begun the Bank of British North America is the largest. This is to be a four-storey building, the ground floor space reserved for the Banking room and the upper floors as Offices. The front will be of Bedford stone with pilasters, cornice, pediment, etc., and when completed will rank among Winnipeg's finest buildings.

The Steele Apartment Block which has already part of the foundations in is to be a brick building of simple character and has been designed on strictly utilitarian lines.

Of the Warehouses in course of construction, and there is a great number, the Stobart building is the largest. The foundation walls are now being rapidly pushed.

The postponing of the C. P. R. improvements indefinitely, is most regrettable, and it is an action that touches the general welfare of the City. The suspension of operations on this work will affect the North end most directly and will cause building in this district to be put off until arrangements have been finally decided upon. The cause of the delay is due to a question of legal claims that will be instituted against the City by property owners in the vicinity of the proposed subway. As the amount of these expected claims is an unknown quantity and might with all reasonableness reach an extremely high figure, it appears to be a most important factor in the negotiations as to who shall be liable for all such claims that may be filed. As these improvements must be proceeded with in the near future it is to be hoped that a satisfactory understanding can be arrived at immediately and work begun.

A deputation from the Winnipeg Board of Trade left here some days ago for the purpose of interviewing the Dominion Government on behalf of merchants and contractors of this city regarding the tardiness of the C. P. R. in their efforts to facilitate the shipping of goods and materials into the city. This subject cannot be placed before the Government in too trenchant terms as the prosperity of the West and especially of Winnipeg is dependent upon the speedy supply of materials from outside. If the C. P. R. officials are not at fault in this on the plea of increased traffic throughout the country the Government should take steps to devise some scheme that will insure the necessary movement of goods in this district. Building has already been stopped for several days on account of the lack of stone. The stone is quarried and in some cases loaded on the cars but the delay in the transportation of same to Winnipeg has caused valuable time to be lost by waiting.

The real estate boom here is now at its meridian, and city property is, from what I can learn, at a price it will not exceed for some time to come. Outlying districts have been surveyed and laid out, and a sufficient area has been plotted to satisfy the demands of an increasing population for the next decade. Prices asked for local farm lands are so high as to be almost prohibitive to buy even as house property. Winnipeg is flooded with a myriad of real estate agents. Every other office is occupied by a real estate man or has desk room for one, and each has his alluring list of lands for sale to proffer the would be purchaser. Practically half of Winnipeg is for sale by this horde of ephemeral land agents, who foist up the price at each transaction and through whom property in some cases attains a remarkably fictitious value.

I regret that I am not able to forward you for illustration the plans of the Carnegie public library. Two sets of drawings have already been figured on, but the cost in each case is much above the stipulated cost. The plans of the third successful competitor are now being tendered on, and until the figures are received it is impossible to say what will be the next steps taken to proceed with the work of building a library.

W. PERCY OVER.

The cement, which was used in the decoration of the baptistry at Florence, was composed of wax, lime and resin. It was very good for its purpose, for it kept sufficiently moist for five to eight hours, and could during that time be worked as wax, and then it became as hard as stone and did not shrink.—Sir W.B. Richmond.

INTERCOMMUNICATION.

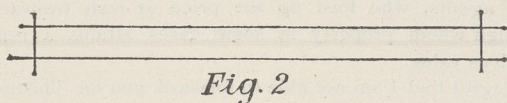
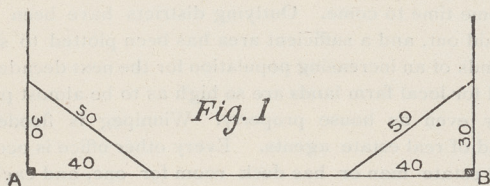
Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries, neither do we undertake to answer questions in issue following their appearance.]

"Subscriber," Bracebridge, Ont., writes: I take the liberty of asking you the following question. A bricklayer takes the job of laying brick (for a dwelling house, 9 inch wall) for so much per thousand, (the owner supplies all material). In finding the amount of brick in building he figures thirteen (13) to the square foot (which is the rule among the brick masons in town). There is an ornamental fireplace (pressed brick) which he figures as solid, taking the greatest width and depth. The owner claims he is only entitled to twelve (12) bricks to the foot (which is the actual amount in a square foot) or in other words is willing to pay him for the amount of bricks delivered on the job, and allows him one-half of the openings. The size of brick is 8"x2 1/2" face measure. Is there a standard rule upheld by law?

ANS. — We think the fairest method of settling the dispute would be to measure the amount of brick-work, deducting the half of all openings, then measure separately the face brick used, superficially, and allow extra for face work. This would be according to custom in this country. In the Old Country the full amount of all openings would be deducted, and chimneys charged as solid. From a legal standpoint the Courts would probably uphold the local custom of measuring 13 bricks to the foot.

"Country Mason": Please inform me of the best way to "lay off" a stone foundation so that the corners will be at right angles, or "square?"

ANS. :—The general principles of setting out a foundation, is to first determine on a front, or a side line, according to the circumstances. Next, set up a square line at each end, the distance between A and B, being the length of the barn or other building. This can be done by measuring off 30 ft., 40ft., and 50 ft., as shown in Fig. 1, produce the sides as far as necessary, and if



both sides are the same length check the squaring by measuring the distance between the ends, which should equal A B. Cord, the same as used for a chalk line, will do for the lines, but fine brass wire is sometimes used. The stakes at A and B may be in line with the outside of the concrete. The width of the trench for concrete or stones may be set off at various points by measuring from the main lines, and stakes may be used for measuring from to get the line of brickwork. Generally, any single wall or pier is set out by lines strained from stakes outside the area as shown in Fig. 2. In the case

of larger buildings setting out by a theodolite is quick and accurate, but the method described above is sufficient for ordinary cases. If the building is small, then make the figures 6, 8, and 10; measure 6 ft., on one side, 8 ft. on the other, then if the lines are at right angles with each other, the diagonal to these two points will be 10 feet. This rule is based on a well known rule in geometry and is perfectly correct.

From "Northwest": Please publish a diagram or sketch for a low cost window frame for a balloon frame house. Frame to be prepared for weights; showing stops, inside and outside finish.

ANS. :—About the cheapest way to make a frame of

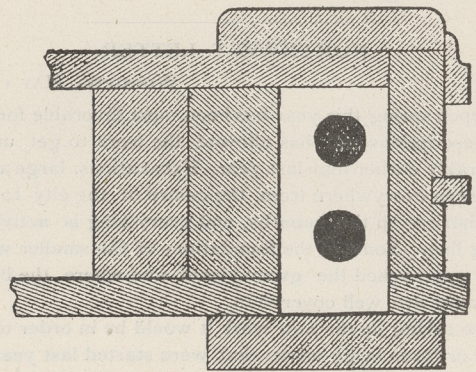


FIG. 3.

the kind desired, is shown at Fig. 3. Here the window stud is made use of for the back of the frame, and the casing on the outside answers for one side of frame, also forming rebate for outside blinds if such are required. Another, and a better scheme for a frame, is shown at

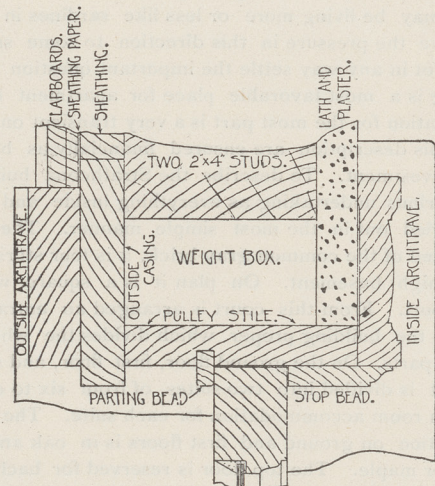


FIG. 4.

Fig. 4. Here also, the stud is used for back of box, and lath for one side which is perhaps, an objection. While either of these frames may do for the cheaper kind of houses, they are not recommended for good

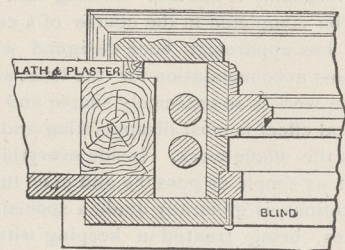


FIG. 5.

work. A better plan, and one suited to any frame house, is shown at Fig. 5. This is simple and econ

omical, but should be built up in the opening, as it can not well be put together in a shop as a frame. This is an advantage in some respects, as it may be shipped to a distance in bundles. Fig. 6, shows how the corner

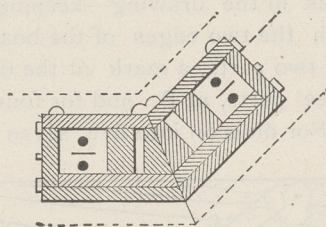


FIG. 6.

of a bay window may be treated, when the sashes on both sides are hung. The face of this may be ornamented to suit the finish of building.

From "Painter": Having an elevator to paint, and will require to make use of ropes for scaffolding purposes, and not wishing to run any risk, I would like to know something about ropes, how they are measured, and how much they will carry with safety?

ANS.—Rope is measured by its circumference. A 3-in. rope of hemp laid properly ought, when new, to bear a working strain of $9\frac{1}{2}$ cwt. Four stranded rope is about one fifth weaker. A cable laid 3-in. hemp rope should bear a working strain of 5 cwt. If a rope gets chafed, showing portions of cut yarns in the lay, and if it creases and absorbs the wet, feeling soppy after rain, suspicion may well be aroused; or the rope may become perished by exposure without showing signs of chafe, which can usually be detected by doubling a portion and striking the bight a few good blows with a mallet, when the outer yarns, if perishing, will break. The simplest is to pick out the weakest spot, probably that which is frequently about the tail block, hitch it to a beam, and subject it to a strain of four times that which is to be worked. Make a bow line in the lower end, a foot or so from the ground, and get four men to put their weight on it. Also examine carefully the nips where the rope passes through the holes in the chair. The working strain of a rope is reckoned at not more than one-fourth of its steady strain by means of weights.

From "Mason": Why is it that a tall chimney has a better draft than a shorter one?

ANS.—The difference is the weight of specific gravity of the hot air inside and the cold air outside makes the chimney draw. This is readily illustrated in observing the upward flow of hot air currents around a stovepipe or the ascent of fire balloons. The higher chimney, having the greater volume of heated air and gases, has the stronger draft.

From "Country Painter": Will you give me some information with regard to hardwood finish, especially how to finish oak in natural and antique?

ANS.—In reply to our correspondent it may be stated that there are various methods of finishing oak in the manner indicated. According to one authority a very clever imitation of general antique may be obtained by staining the filler with equal parts of vandyke brown and charcoal, using about one part of the colored to four parts of the light. Another method of giving oak an antique appearance is to make use of hardwood with as full and open grain as possible, in order to secure a

fine effect. After this has been sandpapered a priming is prepared made of one part of japan, one part raw linseed oil and one part rubbing varnish. Drop into $\frac{1}{2}$ gallon of the liquid 1 pound of commercial corn starch and then add about $\frac{1}{4}$ pound some good dry burnt Turkish umber. Apply to the job a good flowing coat of this priming. Let it stand until it is set and then take a broad putty knife and force it into the grain, working the knife crosswise of it. Let it stand a little while and wipe with a rag, taking especial care to clean out all the corners and get the work into as good shape as possible as regards having the grain well filled. When perfectly dry give one coat of rubbing varnish prepared by adding to it $\frac{1}{2}$ pound of starch to each gallon of varnish. This should be flowed on freely as a medium coat of rubbing varnish and should completely fill the wood. After this has been done the work of varnishing, rubbing and finishing can be executed in the usual manner.

To produce a natural oak finish the above method should be employed with the single exception of leaving out the burnt Turkish umber.

Another method of securing very pretty results in oak finish is to spread on the surface of the material a concentrated solution of permanganate of potash and permit it to remain until the desired shade is secured. A few experiments on a piece of wood will readily determine the proper proportions to be employed. When the shade wanted has been obtained, the wood is carefully washed with water, then dried, oiled and polished in the usual way.

From "M. G.":—Is there any method that can be used to give plain glass panes the appearance of being stained?

ANS.—There is a method of painting on windows, but the process requires an artist to perform the work. The method employed, is the same as that used for painting lantern slides. To do this, one of the first things to have impressed on one's mind, is "not to color the work, but to tint it." The colors must be transparent, aniline colors are the best but they require special handling, or they will "creep" and often fade. The vehicle to mix them in, should be either Canadian balsam or Damar varnish, if the best results are desired. Any lady who has practiced painting in oil, may be able to do a pretty fair piece of work—but it takes time. The glass must be made perfectly clean—the work must be done on the inside of the sash—then the ground tints should be laid on in their proper places. When dry, and deeper colors are wanted, apply more tint until the required depth of color is obtained. When the work is done, it may be protected by a thin coat of Damar varnish. This will look very well, but will fall far short of the artistic effects of real stained glass. There is a material on the market, called "glacier" which is prepared to adhere to the glass. It is a sort of silk paper on which ornaments and figures are printed in transparent colors, and it can be cut to suit any shaped glass. It is quite effective, but does not wear very long although we know of several windows that were prepared with this material over 20 years ago, and they are still good, though the colors are a trifle faded. This material, we think, may be obtained in Toronto, certainly in New York—and it does not cost a great deal. A material is also made in England by the Cloisonne Glass Co., 66^B Berners St.

Oxford St., London W., and is called "cloisonne glass," which is similar to "glacier." It costs about 8 or 10 cents a square foot.

From "Workman":—Please advise me if the white figures on blued steel-squares, are permanent or not?

Ans.—The figures are inlaid with hard porcelain cement, which is said to be "burned in" at the time of "bluing." If this is the case, and we have reason to believe it is, the figures are likely to last as long as the square itself with ordinary usage.

GERMAN PRACTICE IN CHIMNEY CONSTRUCTION.

A tall mill or furnace chimney is a great test of the builders' art and of the strength of his materials, says the British Clayworker. The stresses to which the bricks are subjected and the conditions to which the mortar is exposed are all abnormal from the point of view of ordinary building construction. Again, compared with other brickwork, tall chimneys occupy but short time in building, hence it is of the utmost importance to pay attention to the composition of the mortar, which must be so arranged that even while yet "green" it may be able to sustain the immense superincumbent weight.

Opinions differ very much amongst builders as to the right kind of mortar to employ. Many consider that lime-mortar, strengthened by the addition of Portland cement, is the best when the work has to be carried out quickly. Of course lime-mortar alone becomes equally strong in time, but it does not harden quickly enough, although when "set" it certainly resists the action of the heat better. And the interior of many tall chimney stacks, especially near the base, often has to sustain very considerable temperatures.

If lime-mortar is employed in building high chimney stacks the construction must proceed slowly, and the joints must be frequently tested to see whether they are hard enough to bear the courses which have to follow.

In Germany tall chimney builders are now using a mortar composed of a mixture of cement, lime, and sand in the proportions:—

Cement : Lime : Sand : : 1 : 2 : 6

for the upper portion of the chimney stack, where the gaseous products of combustion of the fuel are comparatively cool; but for the lower portion of the stack, where the temperature of the smoke and fumes is comparatively high, the proportions are:—

Cement : Lime : Sand : : 1 : 2½ : 8.

If the lime is of hydraulic nature the proportion of the cement may be reduced: but if the sand is very "sharp" the proportion of cement must be increased.

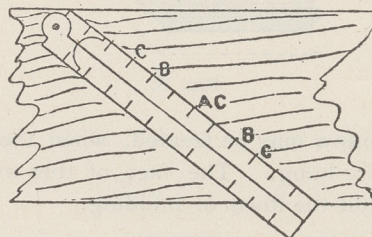
For the cap of a tall chimney stack the proportions of the ingredients of the mortar may be altered with economy and advantage. In German practice the mortar is composed of:—

Cement : Lime : Sand : : 1 : 1 : 4.

Mortar made of cement and sand alone is not at all suitable for tall chimney work, because it does not resist the action of heat well, and is attacked by carbon dioxide, of which there is always a large quantity present in the flue gases; this is especially the case in the presence of moisture, and, of course, steam is always present in the gases which are found in a smoking chimney.

TO MARK BOARDS INTO TWO OR MORE EQUAL WIDTHS.

The readiest method of doing this, no matter what the width of the board is, is to lay the rule across it diagonally—as in the drawing—keeping the ends of rule level with the two edges of the board. Then to divide it into two parts, a mark at the 6 in. will do it, as A; for three parts, at B, and for four parts, at C, and so on. For division into five, seven or nine parts,



open the rule, and place it to the 12½ in., 14 in., and 12½ in. marks respectively, when the division will be at the 2½ in., 5 in., &c., marks, in the first case; at the 2 in., 4 in., &c., in the second; and at the 1½ in., 3 in., &c., in the third case.

By this method it is easy to equally divide any board, no matter what the width is, into any number of parts, without the trouble of making exact calculations, or any waste of material.—The Woodworker.

FRESCO PAINT.

According to the Painters' Magazine, the following formula makes an excellent distemper for interior work. It works freely, and the most perfect results may be obtained by its use.

The medium given below may be used for mixing either the pale or richer colours and tints, lakes, &c. Decorators will also find it a valuable material for hastily preparing washes for ceilings, walls, &c. Its main features are that if mixed with suitable colours it may be used upon any class of distemper work; it is easily prepared for use by simply stirring sufficient warm water to render it fluid.

The following are the ingredients:—Pale glue, in powder, 2 lbs.; glucose, ¼ lb.; glycerine, ¼ lb.; salicylic acid, 1 oz.; and water three gallons.

METHOD OF PREPARATION:—Dissolve the glue in two gallons of boiling water. In another vessel dissolve the salicylic acid in one gallon of boiling water. Now add together the contents of the two vessels. Allow time to cool somewhat, then stir in the glucose and glycerine. It is then ready for use, and should be mixed into a paste free from lumps, thinned down with a little warm water, and used in the ordinary way. It will keep without turning rancid for a considerable length of time.

The law in Canada to-day as recently expressed by the Toronto courts in the case of the T. Eaton Co. vs. John Guinane declares that the tenant who puts in gas or electric fixtures in a house may take them with him when he moves; but the owner of a store who puts them in cannot remove them if he sells the property.

Barbadoes asphaltum is used for many purposes. Made into a liquid with suitable oils, by fusion, it forms an excellent protection for ironwork against corrosion. Iron pipes coated with this material and placed beneath the ground for a considerable time have remained intact. It is now being utilised as a protective medium against corrosion for the bottom of steel ships. A small quantity placed in spirits of turpentine or kerosine, and dissolved by agitation, will form an oak stain of a deep, rich colour, which may be used with advantage upon new woodwork.

SOME CAUSES OF PAINT PEELING.

A fruitful cause of the peeling of paint is when the several coats are successively applied before the foundation or preceding coat has thoroughly dried, the result being that the liquid in the outer or last applied coats softens the pigment in those previously applied. The resulting mass, containing a notable amount of the more volatile elements of the liquid, beginning to dry from the outside surface, forms a thin, but hard or vitreous surface that retards the further evaporation of the volatiles, and prevents the access of oxygen from the air, which is necessary in the process of drying.

If the surface thus covered has been painted while at a low temperature or during damp or foggy atmospheric

Parts of Cement to 1-Sand	Mortar proportioned by volume of packed Cement and loose Sand					Maximum Minimum	Ashlar, 18 Courses, $\frac{3}{4}$ Joints Per Cent Mortar $\left\{ \begin{smallmatrix} \text{Min. } .03 \\ \text{Max. } .04 \end{smallmatrix} \right.$					Ashlar, 12 Courses, $\frac{3}{4}$ Joints Per Cent Mortar $\left\{ \begin{smallmatrix} \text{Min. } .04 \\ \text{Max. } .05 \end{smallmatrix} \right.$				
	Portland		Natural		Sand Cu Yd		Portland		Natural		Sand Cu Yd	Portland		Natural		Sand Cu Yd
	Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.			Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.		Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.	
0	7.40	0.00	8.40	7.42	0.00	Min. Max.	0.22 0.31	0.00 0.10	0.25 0.30	0.20 0.27	0.00 0.00	0.44 0.59	0.00 0.00	0.50 0.67	0.41 0.54	0.00 0.00
1	4.17	0.57	4.87	4.29	0.58	Min. Max.	0.12 0.15	0.02 0.03	0.14 0.19	0.12 0.16	0.02 0.02	0.23 0.31	0.04 0.05	0.28 0.37	0.25 0.33	0.04 0.05
2	2.91	0.78	3.24	2.85	0.76	Min. Max.	0.07 0.10	0.02 0.03	0.09 0.12	0.08 0.10	0.02 0.03	0.15 0.19	0.05 0.06	0.18 0.24	0.16 0.21	0.06 0.06
3	2.08	0.85	2.38	2.10	0.81	Min. Max.	0.05 0.07	0.03 0.04	0.06 0.08	0.06 0.06	0.03 0.03	0.10 0.14	0.05 0.07	0.13 0.17	0.11 0.15	0.07 0.07
4	1.66	0.89	1.80	1.59	0.86	Min. Max.	0.04 0.05	0.03 0.04	0.05 0.07	0.04 0.06	0.03 0.03	0.08 0.11	0.05 0.07	0.10 0.13	0.09 0.12	0.05 0.07
5	1.35	0.91	1.48	1.31	0.88	Min. Max.	0.03 0.04	0.03 0.04	0.03 0.05	0.03 0.04	0.03 0.04	0.07 0.09	0.06 0.07	0.07 0.10	0.06 0.09	0.05 0.07
6	1.14	0.93	1.38	1.21	0.89	Min. Max.	0.03 0.04	0.03 0.04	0.03 0.05	0.03 0.04	0.03 0.04	0.06 0.08	0.06 0.08	0.07 0.09	0.06 0.08	0.05 0.07

Parts of Cement to 1-Sand	Maximum Minimum	Brickwork Standard size, $\frac{8}{8}$ Joints Per Cent Mortar: Min. .10 Max. .15					Brickwork Standard size, $\frac{8}{8}$ to $\frac{7}{8}$ Joints Per Cent Mortar: Min. .25 Max. .35					Brickwork Standard size, $\frac{8}{8}$ to $\frac{1}{2}$ Joints Per Cent Mortar: Min. .35 Max. .40				
		Portland		Natural		Sand Cu Yd	Portland		Natural		Sand Cu Yd	Portland		Natural		Sand Cu Yd
		Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.		Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.		Cem't bbl.	Sand Cu Yd	West. bbl.	East. bbl.	
0	Min. Max.	0.74 1.11	0.00 0.00	0.84 1.26	0.68 1.02	0.00 0.00	1.85 2.59	0.00 0.00	2.10 2.94	1.70 2.38	0.00 0.00	2.59 2.96	0.00 0.00	2.94 3.36	2.38 2.72	0.00 0.00
1	Min. Max.	0.39 0.50	0.06 0.10	0.47 0.70	0.61 0.62	0.09 0.10	0.96 1.35	0.15 0.22	1.16 1.63	1.03 1.44	0.15 0.21	1.35 1.55	0.22 0.25	1.63 1.86	1.44 1.64	0.21 0.22
2	Min. Max.	0.24 0.36	0.08 0.12	0.30 0.45	0.26 0.39	0.08 0.12	0.60 0.87	0.20 0.28	0.74 1.04	0.65 0.91	0.19 0.27	0.85 0.97	0.28 0.32	1.04 1.19	0.91 1.04	0.27 0.31
3	Min. Max.	0.17 0.26	0.09 0.13	0.21 0.32	0.19 0.28	0.13 0.13	0.48 0.60	0.32 0.31	0.53 0.74	0.47 0.65	0.21 0.29	0.61 0.69	0.31 0.36	0.74 0.85	0.65 0.75	0.29 0.34
4	Min. Max.	0.14 0.20	0.09 0.14	0.16 0.25	0.15 0.22	0.09 0.13	0.34 0.47	0.23 0.32	0.41 0.57	0.36 0.50	0.27 0.30	0.47 0.54	0.32 0.36	0.57 0.66	0.51 0.58	0.30 0.35
5	Min. Max.	0.11 0.17	0.09 0.14	0.12 0.18	0.11 0.16	0.09 										

conditions and soon after there happens to be a marked rise in the temperature or a fall in the hygroscopic condition of the atmosphere, then the paint is liable to peel at once, or soon after the change. This effect is hastened in the case where the coating is a heavy one, or one hard to spread by reason of the earthy or inert substances in the pigment, or if benzine has been used as a drier.

As a general rule, the more substances that enter into a coat of paint, either as pure pigments, inert substances or in the composition of the liquid, the more liable is it to peel. A small amount of fish or animal or non-drying vegetable oils, though oxidised by the addition of metallic salts and used in connection with linseed or other siccative oils, also hastens and provides for the certainty of the peeling.

A pigment composed of a number of substances, the different materials of which by themselves would form the basis of a good paint, when combined together with the liquid, necessarily must undergo a different chemical action than the several members of the pigment would have done had they been used alone.

This chemical action is furthermore complicated by the combinations going on in the liquid, which, formed of a number of different elements that act and re-act upon one another, and mixed with the heterogeneous pigment, develops a series of chemical actions in the mass, the weaker element of which, either the mineral or the organic, is the first to break down or change, the decay of which hastens the decomposition of the others and releases the bond between the paint and the surface over which it is spread, and the peeling process is effected.

That these chemical changes exist in the above stated case cannot be denied, but

have not been well accounted for. The fact remains, however, that certain paints peel, and though analysis of the peeled portion may reveal nothing to indicate the reason for the peeling, it is seldom possible to get a sample of the original paint as applied, to compare its constituents with the peeled sample, and the cause is relegated to the hidden drawer of the paint shop, near which some scapegoat can be found to bear the burden of failure.

Making a man of himself is the biggest job any contractor ever undertook, but it's a job that is well worth the while.—*St. Louis Builder.*

An agreement has been reached between the master and journeymen plumbers of London, Ont., under which wages will be advanced 7 cents per hour.

LOWERING A TALL FLAGSTAFF.

Lowering a 200-foot flagstaff at the grounds occupied by the Chicago Exposition of 1893, was very simply and ingeniously accomplished by Mr. E. F. Terry without the use of any large derricks, gin poles or complicated apparatus. The pole had a total height of 175 feet above the surface and extended 20 feet below the ground in a mass of concrete and riprap. It was made of two timbers, the lower one about thirty and the upper one about twenty-two inches in diameter. The upper one was seated on a step clamped to one side of the lower piece a few feet from its top and was secured by two heavy iron bands around both pieces. A narrow trench was excavated in the surface of the ground on a line in which the pole was to be felled. It was commenced close to the flag pole and carried down nearly to its lower end and as fast as it was opened the pole inclined towards it so as always to be supported for a minimum of 20 feet on the sloping face of the trench. The concrete, riprap and earth was carefully picked out from under the bearing on the side of the pole, thus lowering it very gradually and increasing the length of contact and diminishing the angle of the slope as the top of the pole gradually revolved downward and the bottom tended to rise in the opposite direction, but was held by the weight of earth and riprap above it.

The pressure at the foot of the pole gradually increased with the surface of contact and the movement was slow and regular with no signs of tearing out the foundations. When the pole had revolved a considerable distance and the trench had been opened a long ways from its base, its angle with the horizontal became so small that the splice between the upper and lower timbers could be supported on a trestle bent from the surface of the ground. This was done and the upper end of the pole was removed for fear that the increasing flexure might break the splice between the timbers. Afterwards the remainder of the pole was lowered flat on the ground and the work completed without difficulty or accident. The work was done by ten men in four days.—Engineering Record.

LEGAL

A novel action was entered in the Canadian Courts last month by the Canadian Locomotive Company, of Kingston. The company apply for an injunction to restrain two of the leading newspapers of Toronto from publishing any notice, advertisement, or threat in these words, "Machinists keep away from Kingston; strike still on," or in any similar words, or words to the like effect. The plaintiffs also ask to have the defendants restrained from publishing in any such language as the foregoing any reference to "the business operations of the company in connection with their employees or ex-employees or persons who may become employees." The company have for a year or more been contending with a strike of their workmen, and are seeking to deprive the strikers of a method which has been freely used to keep away outsiders.

According to recent decisions in the British Courts, a contractor is not entitled to the ownership of old materials on the site of proposed new structures, unless there exists some agreement conferring ownership. The contractor's safest plan is to introduce a clause stating whether the materials are to remain the property of the employer or to be taken by the builder at a price to be determined. The clearing away of old materials when stated in specifications cannot be supposed to mean that in all cases they become the property of the contractor. In order that there may be no doubt on the subject, the contracts of the British War Department usually stipulate that old materials are to be stacked and become the property of the Secretary of War, and that example, if followed, will often prevent disputes.

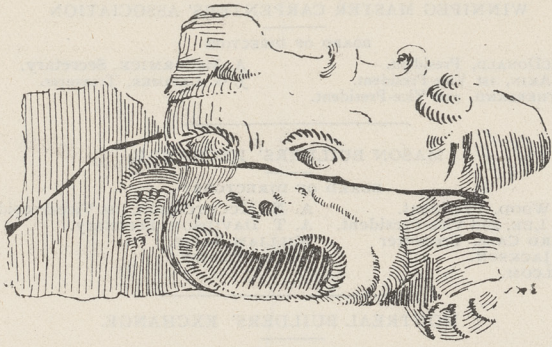
Keenan v. Ronallo.—Judgment of the Court of Appeal, King's Bench, Montreal, Sept. 25th, 1902. A. R. was employed by contractors who were constructing a sewer. Part of his work was to clean out holes where the dynamite had exploded in the blast. While doing this upon one occasion an explosion took place which killed him. The parents sued the contractors for damages, alleging that the accident was caused by negligence for which they were responsible. The latter claimed that the deceased had himself been imprudent in using a crowbar contrary to orders. The trial court held, however, that as a foreman had been in charge of the work it was his duty not only to forbid the use of a crowbar, but also to have stopped the deceased from so using it, and that the contractors were liable for their foreman's failure to do so. The trial court also held that the operation of cleaning out the old holes was a dangerous one, and that new holes should have been bored. Judgment was, therefore, given against the contractors for \$1,999. The contractors appealed from this judgment and the Court of Appeal came to the conclusion that as a matter of law the contractors had not been negligent; and that as a matter of fact, the evidence showed that the making of new holes would not have obviated the chances of an explosion. The judgment of the first court was therefore reversed, and the action against the contractors was therefore dismissed.

New legal points in cases affecting contractors are constantly arising, as was demonstrated when Judge Edge admitted at the Clerkenwell County Court that he had never heard of an action similar to that before him. The case was *Williams v. Bronsdon*, in which damages were sought against the defendant for personal injuries resulting from defects in materials supplied by him. The plaintiff in November, 1901, contracted to plaster certain houses for the defendant, who was to provide the necessary materials, viz., lime, sand and crushed slag. It was affirmed by the plaintiff that he complained of the coarseness and roughness of the slag, but was overruled. When plastering the houses his hands became so damaged by contact with the stuff he was compelled to give up work and subsequently the first joint on the index finger of his right hand had to be amputated, which prevented him from working for three months. An analyst after examining the slag reported that it contained a percentage of organic matter. The doctor who attended the plaintiff agreed with the analyst that the plaster was not likely to contain deleterious matter. Another workman however, had suffered in the same way. On behalf of the defendant it was urged that there was no evidence of negligence, and that if the plaintiff used the material knowing it to be unsuitable he was guilty of contributory negligence. The defendant stated that he had employed a trustworthy contractor to supply the material, and a number of witnesses were called to prove that the material usually so supplied was satisfactory. His Honor said it was clearly the duty of the defendant under his contract to supply proper materials and the evidence showed that in order to carry out this obligation he had employed a competent contractor. Further, before finding the defendant liable, the jury would have to be satisfied that the plaintiff had not been guilty of contributory negligence in continuing to use the slag for plaster, although he knew it was unsuitable. The following questions were left to the jury and the findings:—(1) Did the defendant supply improper material?—Yes. (2) Were the injuries sustained by the plaintiff due to the use of those materials?—Yes. (3) Was the defendant guilty of negligence?—Yes. (4) Was the plaintiff guilty of contributory negligence?—No. (5) Damages, if any?—50l. Judgment for this amount was entered with costs.

NOTES.

Messrs. Frederick J. Drake & Company, of Chicago, have just published a new work entitled "Practical Uses of the Steel Square," by Fred. T. Hodgson, of Collingwood, Ont. This book is an extension and amplification of previous publications by the author on this subject, and in addition includes new matter culled from various sources. Numerous illustrations serve to make clear and more valuable the letter press. Canadian orders for the book, which sells at one dollar per copy, may be addressed to the CANADIAN ARCHITECT AND BUILDER.

A correspondent who has to put in a price for painting and regilding the clock face of a church, about 5ft. 6in. in diameter, and 60 ft. or 65 ft. from the ground, asks the best kind of paint to use as a basis; the number of gold coats to make a sound job; how many books it will take and an idea as to a fair price for the job. Carefully clean and scrape the face, coating first with lead colour, one coat good oil black, one coat spirit black. Gild, and give two coats of varnish, but do not varnish the gold. Lay in with best gold size, to dry in from 18 to 24 hours. One layer of gold is sufficient.



GARGOYLE, CORHAMPTON CHURCH.

PROPOSED TECHNICAL INSTITUTE FOR MONTREAL.

The Committee representing the educational institutions and various public bodies in Montreal appointed to enquire into the question of the establishment of a Technical Institute in that city has presented the following report:—

"Your Committee is of opinion that the time is ripe for the establishment in this city of a technical institute suitable to the needs of the people. Should the citizens be in earnest in the desire, which has been so frequently and widely expressed, for such provision as will enable the boys and girls, the young men and women, to have better facilities for securing an education along the lines indicated in the report submitted by the delegation which visited the States, your Committee has no hesitation in saying that such an institute could be erected, equipped and placed in working order, in a satisfactory manner without delay.

Such an institute should be built in sections, commencing with the departments for which there seems to be the most pressing need. In every case these sections should be built with a view of future extension. The work could then proceed so as to allow of expansion as funds become available.

Sec. 1. It is further recommended: That courses of instruction in mathematics, English, French, science, the elementary principles of mechanical and electrical engineering, and in mechanical drawing, etc., be commenced in September next.

Sec. 2. That as soon as practicable, steps be taken for the erection of a section devoted especially to technology, and of the general dimensions and character indicated in the accompanying rough sketches.

On the ground floor is located offices and a machine shop.

On the second floor is placed the wood-working shop, together with a suitable lecture room and other offices.

The third floor is sub-divided into laboratories for wood-carving, art metal work, etc.

The whole of the fourth floor is set aside for descriptive geometry and mechanical drawing.

In recommending a building of this type, for immediate erection your Committee is influenced by the fact that there is evidently a very wide demand for such courses of instruction as would then be possible. As a proof of this it may be stated that considerably more than \$100,000 per annum is being paid to correspondence schools in the United States by mechanics in this city desirous of obtaining instruction in the elements of mechanical engineering, etc.

Sec. 3. The second main section of the institute, which your Committee considers of great importance, should be devoted to applied art and design and to domestic science. These branches could be provided for in a building of the same general dimensions as that devoted to technology.

The fourth floor of such building might be devoted to the domestic science department, including biology, the study of foods, cooking, dressmaking, millinery, needlework, art needlework and embroidery, together with the necessary lecture rooms.

On the third floor provision may be made for the freehand drawing, drawing from the model, modelling in clay, and drawing from life.

On the second floor provision may be made for applied art and design in its various branches, including drawing from the life, painting in water colors and in oils, the design and painting of fabrics, wall papers, book engravings, posters, etc., and all different kinds of art work.

On the ground floor are placed the administrative offices of the whole building, also a museum, library, etc.

Your Committee is of opinion that there is an increasing demand for instruction in art and design, and also in domestic science. This is proven by the fact that large numbers of young people of Montreal are obliged to leave the city to obtain the instruction in question, while the demand for classes in domestic science is far greater than can be met by present arrangements.

Again, as has been already pointed out, the great success of the Philadelphia Textile school has been largely due to the fact that it has been worked in connection with a school of art and applied design. Your Committee, therefore, considers that it is of the highest importance to all interested in textile industries, to note that in the proposed department of applied design they will have the fundamental provision which is so necessary to the complete success of textile work. Your Committee would suggest that the textile department be erected, with a school of art and applied design, as shown on sketch. The general equipment and arrangement of these must be decided upon by authorities on textile work, of whom we have many able expositors on our Committees.

TRADE DEPARTMENTS.

Sec. 4. Next in order, and, in the opinion of your Committee, of great importance, is the proper establishment of suitable departments for the various trades, carpentry, plumbing, brick-laying, stone cutting, galvanized iron work, blacksmithing, fresco work, house painting, wiring, etc. There is undoubtedly a very large demand for courses of instruction in these departments, and this work should be commenced as soon as possible.

Your Committee is of opinion that steps should be immediately taken to provide, by correspondence, such courses of instruction as may meet the demand of those in this country who are too far from the city to take advantage of the special courses to be provided in the proposed technical institute.

Your Committee recommends that other departments be added from time to time as the demand may justify.

Your Committee would conclude this report by expressing the opinion that all students of the Institute should be required to pay fees. It is recommended that the fees for the evening classes be much less than for the day classes, and that the charges for the former be moderate. All the investigations of the Committee go to show that the best results have been obtained in those Institutes where fees are levied, as the students themselves prefer the feeling of independence which they naturally possess with the knowledge that they are paying for the instruction they obtain."

FOLDING.

We have the folding bed,
The folding bath-tub, too,
And folding chairs, its said,
Are nothing very new.

Some hat-racks shut up tight
In most ingenious way;
A couch for use by night,
A Sofa by day.

The folding table's found
Wherever man may roam,
And folding doors abound
In every modern home.

But one thing now we need,
And soon we will have that,
For in brief time, indeed,
There'll be a folding flat.

The Department of Buildings at New York has been conducting a series of tests to discover leakage of illuminating gas in many of the prominent theatres and hotels and Dr. Lloyd, of that city, has been making similar tests in dwelling-houses. The latter experiments had reference to the condition of certain patients who exhibited symptoms bearing close resemblance to those noted in typhoid or malaria, without manifesting the usual stigma of those diseases. As a result Dr. Lloyd found present in the rooms of these patients sufficient quantities of carbon monoxide, one of the constituents of illuminating gas and of sewer gas, to account for the symptoms noted. The device used to ascertain the presence of gas when it could not be detected by the sense of smell was one which brought the air supposed to be contaminated with gas into contact with a strip of paper sensitized. When the gas is present this becomes discoloured, and the depth of discolouration, ranging from rose pink to black, indicates approximately the percentage of gas in the air.

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NOTE.

Mr. Vincent Groom, of Llanrug, Wales, is said to have solved the problem of the disposal of the refuse of slate quarries by perfecting a process by which, it is claimed, the waste can be made into solid blocks, capable of taking a highly-glazed surface in any number of colours. It is claimed that the new substance thus produced will stand a pressure of 100 tons to the inch—more than any natural stone—that it will be lighter in weight, and can be placed on the market at a cheaper rate than ordinary tiles.

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ARCHITECTURAL & POROUS TERRA-COTTA.

NOTES.

A writer who has demonstrated the fact says that 3 pecks of lime and 4 bushels of sand are required to each perch of 22 cubic feet of masonry when built in a wall.

The belfry of the fine old cathedral at Chartres has been found to be in a defective condition. By the winds of centuries and the vibration of the bells the masonry has become dangerously insecure. Repairs are to be promptly made.

In connection with a recent discussion before the Boston Society of Civil Engineers on Foundations Mr. E. W. Howe mentioned a novel method of driving inclined piles in foundations for the Atlantic Avenue bridge by the aid of a steel case 13 inches square and 39 feet long placed at the desired inclination. With this apparatus 95 piles were driven in 10 hours. Mr. R. A. Hale mentioned a chimney 225 feet in height imposing a load of 2,250 tons on an area of 1,225 square feet, the foundation being sharp river sand 19 feet below the surface of the ground, into which piles had been driven to a depth of 5 feet; allowing for wind the extreme pressure is 2.4 tons per square foot and no settlement has occurred.

The United States Fidelity and Guaranty Company, one of the largest, strongest and most favorably known surety companies on this continent with a cash capital and surplus of over three million dollars have established their Canadian head office in Toronto at 6 Colborne st. The joint managers are Mr. Arthur E. Kirkpatrick, one of Toronto's most enterprising young business men, and Mr. J. A. Kennard, late of Baltimore, a lawyer of experience and ability. The bonds of this Company are accepted by the Canadian Governments, municipalities and by railroads and corporations in all cases where a bond guaranteeing the specific performance of a contract is required. They are prepared to furnish bonds at once up to any amount.

It has always been a wonder to us why architects should be so fond of the blocked column, for to our mind it is an ugly feature. It has neither the solidity of the pier nor the grace of the column, and always produces a lumpy effect. The lines of the column are quite spoiled by the clumsy-looking blocks, strung like so many chunks on a rod. We can call to mind a score of buildings which are marred by this feature. Without doubt it has been used by architects of great eminence, but that does not change its inherent defects. And not only is it ugly, but the additional cost of the stone is considerable. We should like to see it altogether abandoned, and, in place, either a solid-looking pier or a column with its graceful lines uninterrupted from base to cap. But we fear the blocked column is being increasingly used rather than

set aside, probably more for ill-considered fashion than deliberate choice. Ill-considered fashion is not a thing to foster.—Building News.



The most artistic and durable color effects on shingles are produced with Shingletint, which is a scientific combination of linseed oil, coloring matter, creosote, and the necessary drying agents.

Among the many shingles stains offered Shingletint is conspicuous not only for its superiority but because it can be called for by its distinctive name, thus offering the consumer protection against inferior goods offered for the same purpose.

When buying Shingle Stains it will be worth while to ignore the "just as good" argument and insist upon Shingletint.

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TERRA COTTA FIREPROOF BUILDING MATERIAL

POROUS TERRA COTTA among underwriters is classed as preferred risk, and the schedule of rates now enforced in the city of New York shows a difference, often great, which, computed means an annuity on large sums of money.

This indisputable fact appeals to architects as representing clients who may soon be exposed to the same classification in Canada. An apparent saving in selecting cheaper fireproof material may be more than lost through increased insurance cost.

POROUS TERRA COTTA FIREPROOFING is a credit to the buildings in which it is used and increases their selling value.

The **Montreal Terra Cotta Lumber Company, Limited,**
N. T. Gagnon, Selling Agent, 204 St. James St., Montreal, Canada.

O. A. A. EXAMINATIONS.

The Examinations of the Ontario Association of Architects were held in April. The following were the successful candidates:

1st Examination.—Messrs. W. F. Sparling, L. C. Montizambert and Edwin Menger.

2nd Examination.—Mr. J. A. Mackenzie.

PAINTERS' AND DECORATORS' CONVENTION IN TORONTO.

At the Nineteenth Annual Convention of the National Association of Master House Painters and Decorators of the United States and Canada, held in Richmond, Va., in February last, a cordial invitation was given the Association by Messrs. Jas. J. O'Hearn and Stewart N. Hughes, President and Secretary of the Toronto Association, to hold its convention of 1904 in Canada's Queen City. The invitation was backed by a letter from the Mayor of Toronto, and was accepted. Mr. Hughes was elected a member of the Executive Committee.

TESTS OF MATERIALS.

The care exercised in Germany to demonstrate the qualities of materials employed in construction, is illustrated by a recently published report of the operations of the Imperial testing station at Charlottenburg. During the year in question 32,580 tests were made, against 31,982 tests in the preceding year. Some of these were carried out at the request of foreigners. Of the 1901 tests 20,391 were of binding material; 12,189 of various kinds of stone. Armed cement was especially dealt with. But many tests were made with trass-lime mortar. There was a considerable increase in the number of samples of lime sandstone, showing that this is coming into use. Another notable feature of the tests was the number of samples of jointless flooring in imitation of linoleum and woodwork. For this purpose for the first time the sandblast has been employed in producing patterns on these materials. A committee appointed by the Minister of Public Works and for Trade and Commerce was charged with the testing of gypsum; samples are being obtained from abroad as well as at home.

FIXING TILES.

The general custom nowadays, says the Builders' Record, seems to be to use copper nails for fixing tiles or stone slates, that is, in work where some little pretention is made to doing the thing well. Of course a speculative builder uses the cheapest thing he can get hold of so long as it lasts long enough for him to sell the house, and he may use iron nails unprotected or perhaps coated with tar. If he adopts galvanized iron nails he no doubt considers he is doing the thing handsomely. But let the conscientious architect avoid being misled into them by the persuasive builder. Zinc or composition nails are better—but not good enough. Wooden pegs seem to have gone out, but they were fully as good as iron nails. In some ancient buildings the tiles were fixed with splinters of bone, and excellent they were for the purpose. And now another instance has recently been offered by a writer in the daily press of an old building at Mansfield which was a good many years ago roofed with stone slates fastened with hundreds of the prongs or tynes of the antlers of deer. They were pegged into holes pierced in the slabs—two to each slate—in the ordinary way. Their use was evidently traceable to the ancient builder's desire for quaintness. It is these little tricks and fancies of the old workmen which more often than not give the quaintness and charm to old country houses so much admired by all our architectural students. All the striving after effect so characteristic of to-day does not make up for the interest we derive from the evidences of the loving hand and thoughtfulness and resource of the craftsmen of old.

Cassidy—Oi want a wreath av flowers, an' put on it, "He rests in pieces." Florist—Don't you mean "He rests in peace?" Cassidy—Oi mane phwat Oi sed. 'Tis fur Casey, thot was blowed up in the quarry.—"Tit-Bits."

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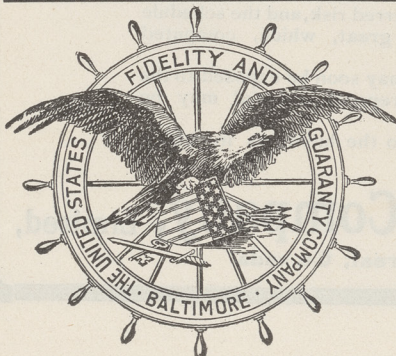
(In Keen's English Cement.)

I wish to lay before the public notice that I am now manufacturing Artificial Marble and that I have to that effect secured the services of Mr. Geo. F. Simpkin, who has had over 12 years experience with the leading firms of this special work in the United States and England. I am now prepared to undertake the manufacture of Artificial Marble Columns, Church Altars, Shrines, Bases, Capitals, Pilasters, (plain or fluted), Decorative Mantels, Dadoes, Pedestals, Etc. Samples of this work can be seen at my office or factory, 304 and 308 St. Joseph St., St. Roch, Quebec City, and at the Hochelaga Bank, M. S. Foley's Bellevue Apartments, Metcalf St., H. Morgan & Co., and Art Rooms, Philips Sq., Montreal.

E. Caron

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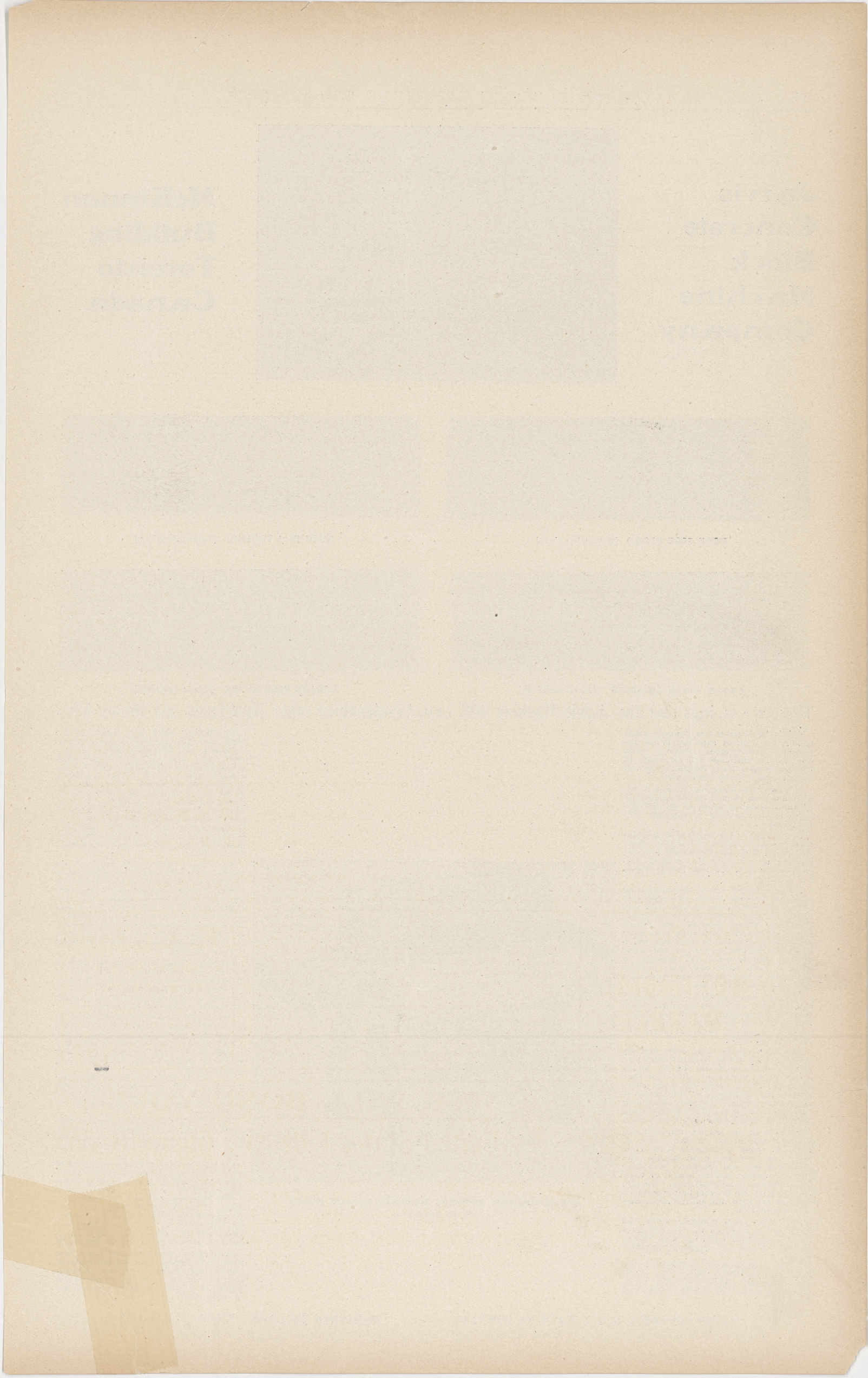
BALTIMORE, MD.

Head Office for Canada, TORONTO. Kirkpatrick & Kennard, Managers
6 COLBORNE STREET.

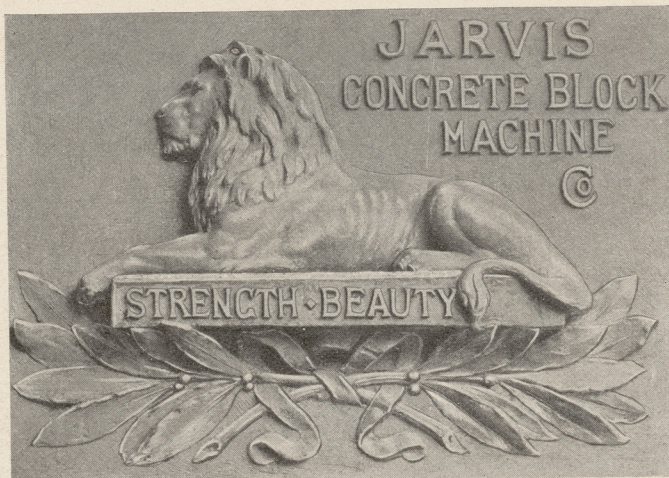
Capital	\$1,650,000 00
Total Cash Resources, over	3,000,000 00
Deposited with Canadian Government	95,000 00

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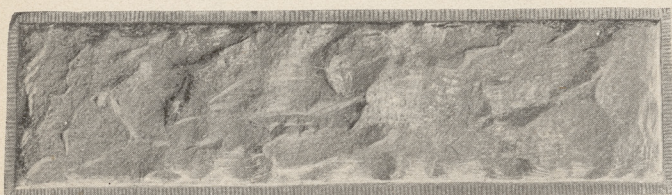
Makes a specialty of issuing contract bonds. A business proposition. Responsible contractors should use us and avoid putting themselves under personal obligations. Consult our local representative.



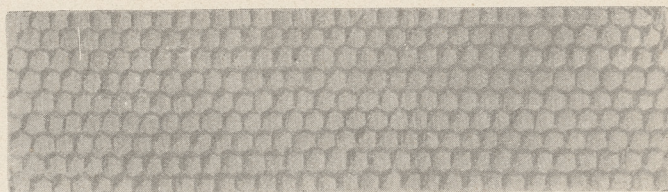
Jarvis Concrete Block Machine Company



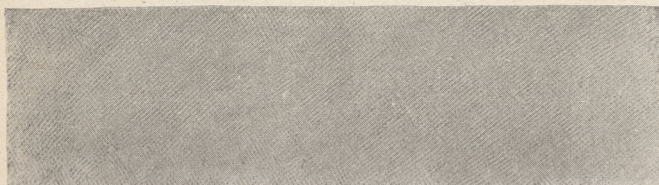
**McKinnon
Building
Toronto
Canada**



ROCK FACE BLOCK [Patent Pending.]



DUCK BILL TOOLING [Patent Pending.]



CROSS TOOTH CHISELED [Patent Pending.]



TOOLED FACE BLOCK [Patent Pending.]

These are facings that the Jarvis Machine will cast, besides three other rock faces not shown here.

This is the Concrete Era. Concrete made of Portland Cement, sand &c., is fast superseding natural stone, as well as brick and steel for buildings, and all kinds of constructions, such as bridges, dams and foundations of every description.

In view of the foregoing facts a Company has been formed for the purpose of manufacturing machines of all descriptions, for the making of concrete constructions.

This Company has acquired from Beaumont Jarvis, Architect, of Toronto, Canada, several of his inventions and patents, relating to machines for forming concrete walls, and concrete facing stones for buildings.

The science and art of manufacturing concrete building stones has advanced with leaps and bounds, so that with any of our machines in one simple operation, durability, beauty, economy, and sanitation, together with insulation from heat, cold, damp, or sound, is absolutely effected since a hollow wall is perfect proof against heat or cold, and concrete is stronger than brick and more durable than most natural stones; any prominent Engineer will verify that.

For a few hundred dollars any one may equip a plant with these machines which will absolutely dispense with the manufacture of brick buildings, having the appearance of natural stone, at about the same cost as brick.

One block has the same cubic capacity as about forty bricks, so that it must necessarily cost so much less for the laying of our hollow blocks per cubic foot than for brick. Then again, the walls being hollow, the building must necessarily be lighter and stronger because concrete is stronger than brick and the hollow space makes the wall lighter than a solid wall.

We have in our employ an architect, engineer and artist. Without these no artificial stone or concrete stone company can have any great success and those who buy our machines will have full instructions, and the benefit of their knowledge as to manipulation. We also employ none but the very best machinists and foundry men, and skilled mechanics in every branch.

For fifty years concrete stone has been used in England for the facing of many important buildings and stands to-day, without any apparent weathering.

At the present time in France many important buildings have been faced with concrete stone and also many cities throughout the United States and Canada.

This hollow block is a registered design, and was invented by a practical architect, Mr. Beaumont Jarvis, of Toronto, Can. The object of this invention is to make a stone facing to a wall, having a hollow space, which is a non-conductor of heat, cold, or sound. The advantage of the hollow cement blocks made by the Jarvis Concrete Block machine, as compared to other blocks is in the fact that it only requires one half the time and labor to manipulate the machines than any other on the market. The new machine is more simple, and one half the expense of any other.

We supply with each machine six plates, so that the stone cast by the Jarvis Concrete Block Machine may have any tooling or rock face that may be required, the same as the natural stone. The size of the stone is 1-5" x 8 1/2" x 2' 6", or in case of hollow blocks the size is 8 1/2" x 10" x 30". Three men doing their own mixing without any other machinery, can make from 100 to 150 blocks per day, which is equal to 250 to 350 feet.

The above block is a registered design, and any one infringing on this will be prosecuted, and a reward will be given to anyone for information that will lead to the conviction of any person or persons infringing on the said invention.

These blocks can be manufactured at about 11 cents per foot, and sills and heads should not necessarily cost any more.

Most natural stone costs from sixty-five to eighty-five cents per foot. Is it any wonder these blocks are bounding into popular favor?

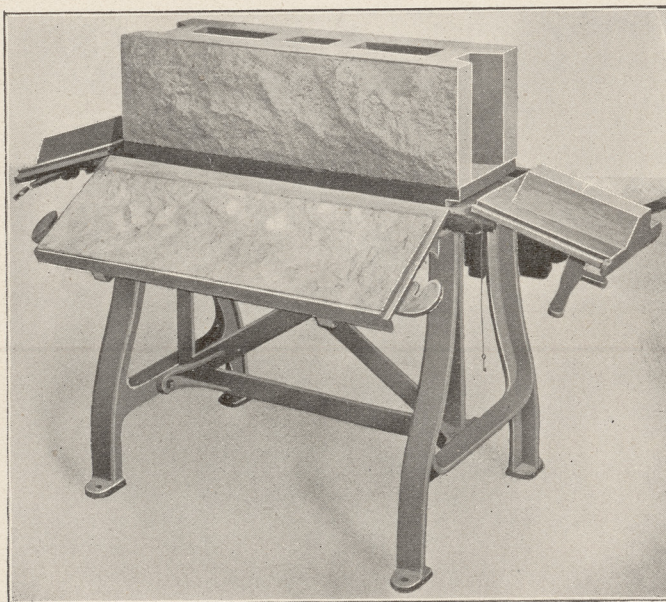
The Jarvis Concrete Block Machine Company is also prepared to undertake all kinds of concrete construction such as dams, bridges, and foundations of all descriptions.

The Portland Cement industry throughout the world is developing to stupendous proportions and has superseded natural stone in addition to wood and steel.

A properly made concrete stone should have all the appearance of natural stone, and every engineer is aware that concrete is everlasting.

The Pantheon, at Rome, has a concrete dome of 142 ft. in diameter and has weathered the storms and other destructive influences for nearly two thousand years and is to-day, apparently, in as good a condition as the day it was built.

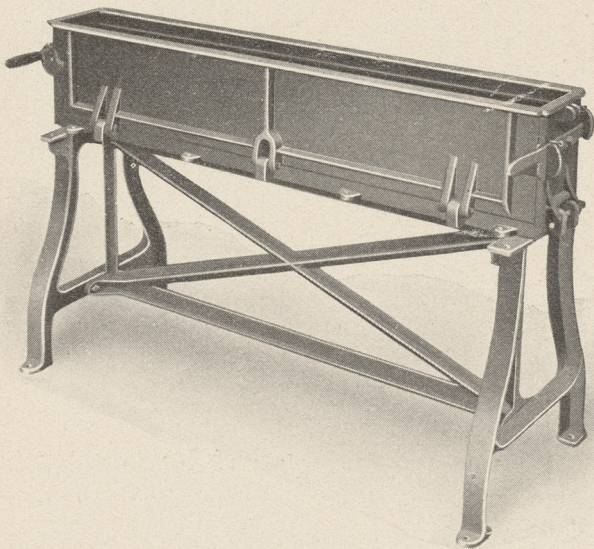
In England, where natural stone was used for facing and concrete for the backing, the natural stone has crumbled away and the concrete backing, which was intended to play the secondary part is better than ever.



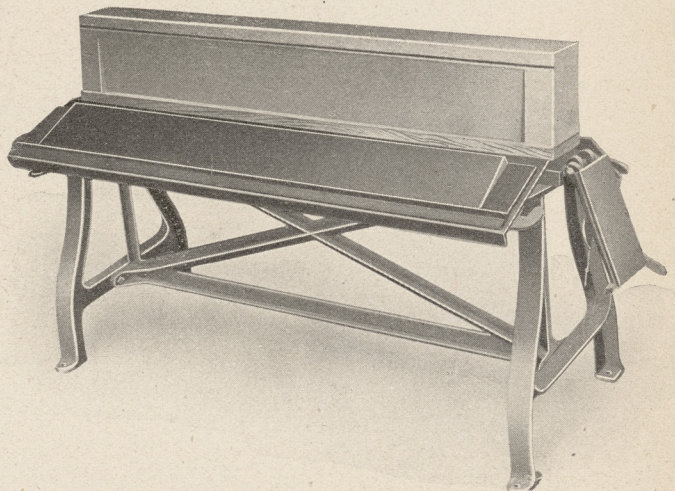
JARVIS MACHINE SHOWING MOULDED HOLLOW BLOCK
[Patent Pending.]

Jarvis Concrete Block Machine

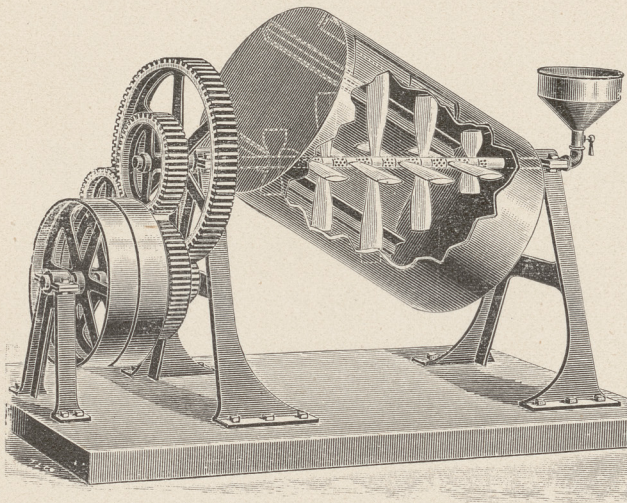
PATENT APPLIED FOR



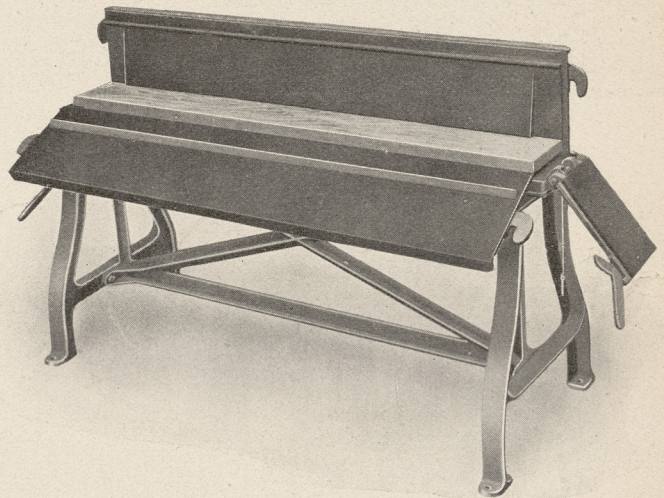
JARVIS SILL MACHINE READY FOR USE. [Patent Pending.]



MACHINE OPENED SHOWING CAST WINDOW SILL [Patent Pending.]



JARVIS CONCRETE MIXER. [Patent Pending.]



JARVIS SILL MACHINE OPEN [Patent Pending.]

Concrete Mixer

This is the best Concrete mixer known. Each revolution without the aid of the blades inside will turn over the mix four times in the opposite direction to one turn the drum, should make it equal to about 16 turnovers at one revolution of the drum.

The only way to get a good concrete is to have the proper proportions of cement and sand &c. well mixed—men with shovels are not always reliable, and most mixers on the market are still more unreliable than the men. The mixer may be run by hand or motor power.

The axle of the machine is hollow and perforated, so that the water is sprayed gradually into the mix—any other method does not give the best results.

A FEW INTERESTING POINTS

It is only a drum having the axle going diagonally through and having blades revolving in opposite directions.

A gentle spray is gradually sprinkled through the mix by pouring the required number of pails into the hopper.

There is nothing to break off the blocks as in some mixers.

It is the most efficient and up to date mixer, doing the quickest work of any on the market.

There is nothing complicated about it.

Jarvis Concrete Wall Mould

is an invention for the forming of concrete walls for foundations, also bridge piers, dams, &c., &c.

The usual way of building Concrete walls by using scantling and boards is very crude and expensive and also difficult to get straight and plumb.

By this method and device the mould box is moved along the wall thereby actually casting individual stone of any breadth, length, width, or depth in position in the wall.

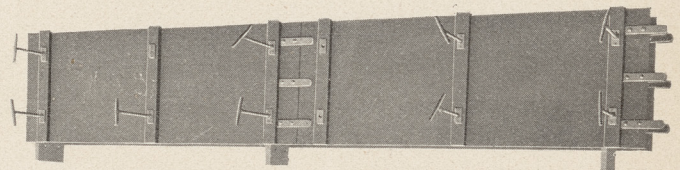
This ingenious device telescopes in every direction and may be 16 feet long if necessary.

In three days the next layers of stone or concrete may be cast so that if your mould box is 3 feet deep it means only twenty days to build a wall 20 feet high.

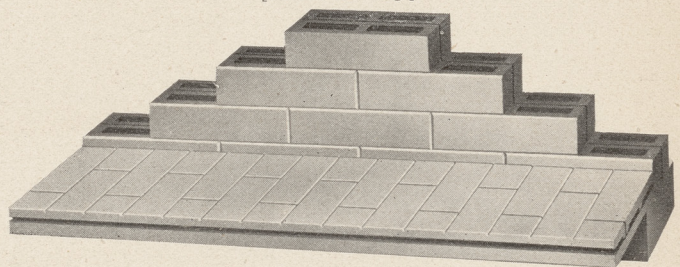
The size of the building does not signify as it only means more moulds and more gangs of men.

Further particulars will be sent to the purchaser with each machine.

JARVIS CONCRETE BLOCK MACHINE COMPANY



JARVIS MOULDING FORMS FOR MONOLITHIC CONSTRUCTION [Patent Pending.]



JARVIS METHOD OF CONSTRUCTING FOUNDATIONS AND BASEMENT FLOORS.

[Patent Pending.]

It can be seen from the above cut that walls and floors formed in this way are absolutely non-conductors of heat, cold, damp and sound. There are 3 air spaces in the walls. Walls of this construction will cost less than brick.

If a whole house were built in this way a great saving of fuel would be the result.

The Jarvis Concrete Block Machine Co. is prepared to arrange with parties to sell district rights, and is also prepared to appoint agents in various districts, who will be allowed a liberal commission for any sales they make.

THE JARVIS TELESCOPE MOULD BOX

This mould box is a telescoping arrangement, so that a stone of any length, breadth, depth or height may be cast. It is also applicable for moulded sills courses or any moulded course by simply dropping down in the bottom of the box a reverse wood mould of what the stone casting is to be. This is probably one of the most ingenious devices ever invented for the concrete stone industry and bids fair to revolutionize all other forms of moulds for casting stone.

MCKINNON BUILDING, TORONTO, CANADA

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NOTICE TO SUPPLIERS OF MATERIALS.

Samples and catalogues of building materials will be received, free of charge by the Quebec Association of Architects, 112 Mansfield Street, Montreal, Canada.

NOTES.

The Toronto Architectural Eighteen Club has put on record its opinion that the most advantageous position for the proposed new public library would be on an ample site as near as possible to the intersection of College street and Queen's avenue.

Piles made of one-to-six concrete, 28 feet long, 12 inches square, tapered at the end, and enclosed in steel wire bands 18 inches apart, are being driven like an ordinary wooden pile for the foundation of a new building now under construction in New York.

Recently carborundum powder mixed with sodium silicate has been successfully applied as a refractory surfacing to furnace bricks. The bricks may be coated with a brush or by immersion. It is claimed that a layer about one-twelfth inch thick will protect the bricks from injury by temperatures met in any ordinary operations.

Mr. Ernest Caron of Quebec has recently commenced the manufacture of artificial marble. The attention of our readers is called to his announcement in the advertisement pages of this number. The material has been successfully used in many important buildings in Montreal, and is endorsed by leading architects of the Province of Quebec.

In the District of Columbia, surveys of buildings during erection

are required. An official plat of each lot to be used as the site of a building is also required. These regulations went into effect March 1st, 1902. Up to June 30 probably fifteen cases of errors of builders in location of party walls were discovered before it became difficult to correct the error.

At a recent meeting of the Master Plumbers' Association of Montreal, the following officers were elected for the ensuing year: Hon. president, J. Date; president, T. O'Connell; 1st. vice-president, C. E. Thibault; 2nd vice-president, R. Egan; 3rd vice-president, E. Lesperance; secretary, John A. Gordon; English corresponding secretary, J. W. Hughes; French, J. Lamarche; financial secretary, F. Brunet; treasurer, J. A. Giroux; chairman sanitary committee, P. C. Ogilvie; arbitration committee, John Watson; auditing committee, J. A. Sadler; legislative committee, T. Christie; apprenticeship committee, T. Moll.

New building regulations have just come into operation in San Francisco. Buildings are divided into three classes. Class A includes absolutely fire proof buildings, which are limited in height to 201 feet. Buildings in Class B are required to have the exterior walls and piers of masonry or of masonry and steel, and all exterior surfaces other than masonry covered with noninflammable materials. The height of buildings of this class is limited to 100 feet. Buildings in Class C are the same in requirements of construction as those of Class B, except as to requirements for interior lathing, and are limited in height to 82 feet. Pitched roofs must not have a slope of more than 45 degrees. The height of frame buildings is restricted to 50 feet. Towers and spires are to be covered with metal.

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Manufacturers
RUBBER STAMPS
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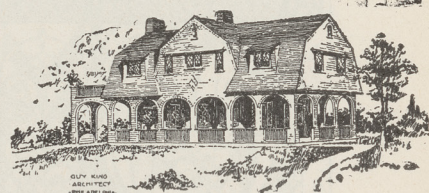
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Cheaper than natural Stone.
Absolutely fire proof material.
No limit to its possibilities of application.

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AND
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Has the exact appearance of natural Stone and is stronger and more durable.

Made in any color or texture for exterior or interior finish.

Contracts executed for anything in Stone or Concrete
Correspondence and Inspection of our plant solicited.

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NOTES.

The value of building permits issued in Toronto during April was \$297,400, as compared with \$575,624 in the same month in 1902.

The Winnipeg Stone Co., Winnipeg, Man., has been incorporated with a capital of \$10,000, to manufacture and dress stone. The provisional directors include L. T. LeFebvre, P. A. Deslauriers, and J. M. LeFebvre, of St. Paul, Minn.

"Samson Spot Cord" is the name of the highest of three grades manufactured by the Samson Cordage Works, of Boston. Although Sash cord is not an important item in the construction of a building, from the cost stand point, there is economy and satisfaction in using the best.

The Mississippi Wire Glass Company, of New York, write that the defects in the roof of the South Terminal Station at Boston referred to in an article in our April issue, copied from

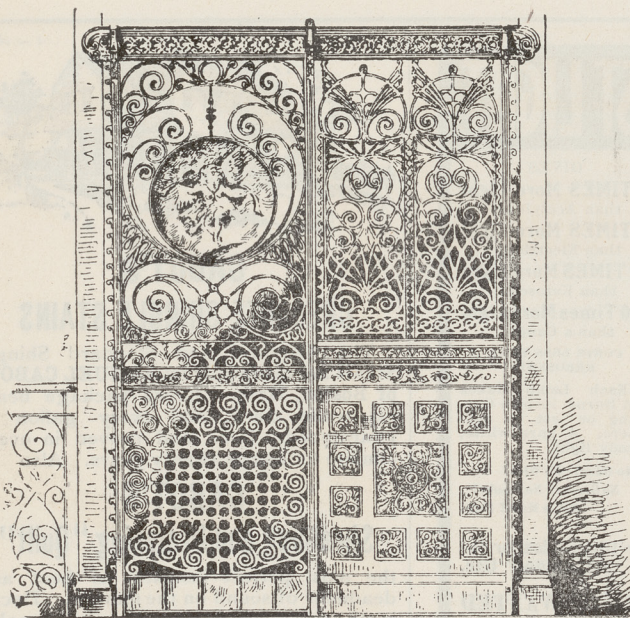
the American Architect, are not to be attributed to wired glass. The material used in this roof is said to be not wired glass but a substitute material. It is said that wired glass is now being put in to replace the substitute material in the roof of the building referred to.

Many times painters have great difficulty in stopping the suction on brick or plaster work which they wish to paint. A perfect article of this kind, and one that is very economical to use by reason of its great covering properties is Breinig's Lithogen Primer. By its use a gloss finish can be obtained without its flattening in spots, or a flat finish without its getting glossy in some places. Where difficulty is met in preventing stains from coming through the Lithogen Primer has accomplished the purpose where everything else has failed. The manufacturers of this article, The Bridgeport Wood Finishing Co., of New Milford, Ct., New York, Chicago and Philadelphia, would be pleased to give information or submit samples.

CANADA FOUNDRY COMPANY

LIMITED

Head Office and Works: TORONTO, ONT.

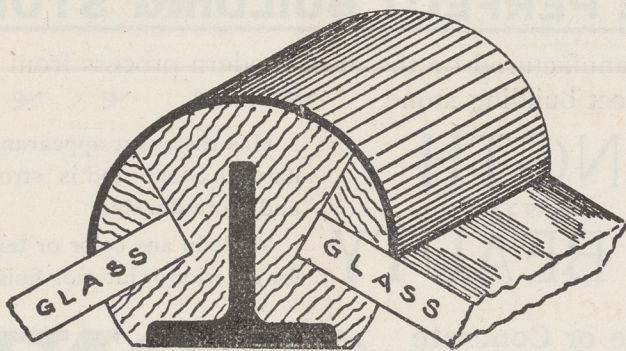


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and Transom Bars - - - -

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Greatest strength for holding costly glass safely.

Strongly recommended by the Plate Glass Insurance Companies and all architects.

J. W. GOULSON & CO.,

96-98 N. 3rd Street,

Columbus, Ohio.

NOTES.

A Committee of the National Association of Master Painters of the United States, is drafting a standard form of specification which will be submitted for the approval of the American Institute of Architects at the annual convention of the Institute in December.

The City Council of Montreal, have rescinded the resolution passed last year accepting the offer of \$150,000 by Mr. Carnegie towards the erection of a public library. The principal reason given for this action is that it is feared that in the selection of

books and of a Board of Management discord might ensue among citizens of different races and holding different beliefs on moral and religious subjects.

The discovery has been announced by Mr. Maximilian Toch, a distinguished Chemist, that while structural steel is protected from rust when covered by cement containing only oxides, silicates and aluminates of lime, its corrosion is induced by contact with cement containing sulphites and sulphates. Plaster of Paris with which some of the foreign cements are said to be impregnated, also acts as a destructive agent.

DR. ROBERTSON, PRESIDENT.

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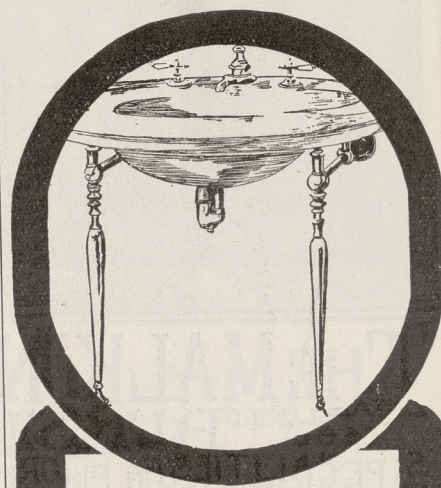
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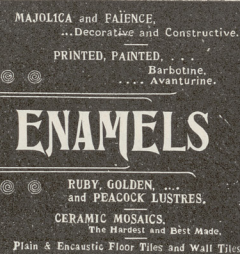
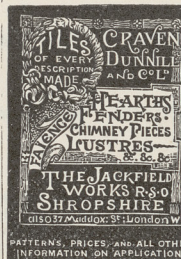
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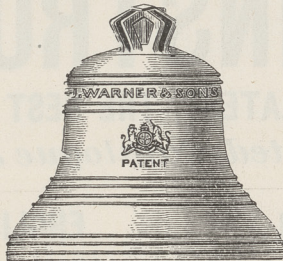
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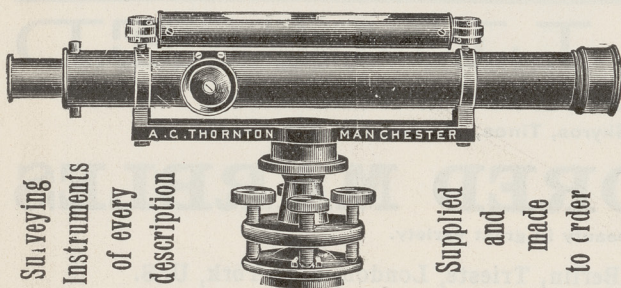
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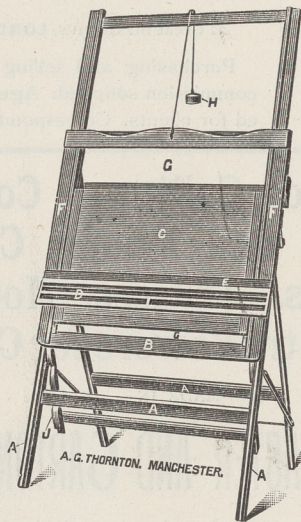
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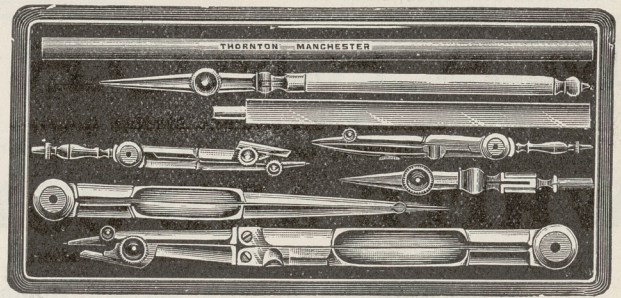
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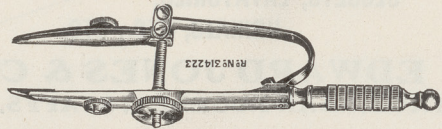
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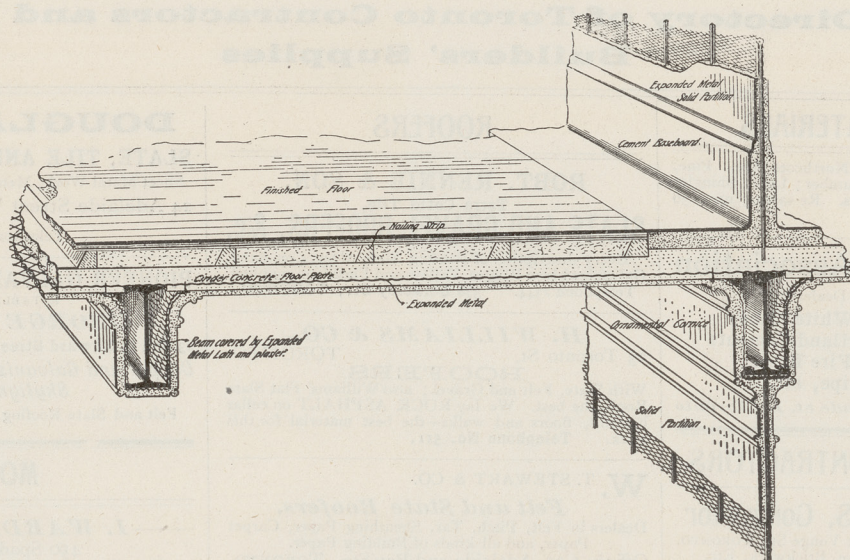
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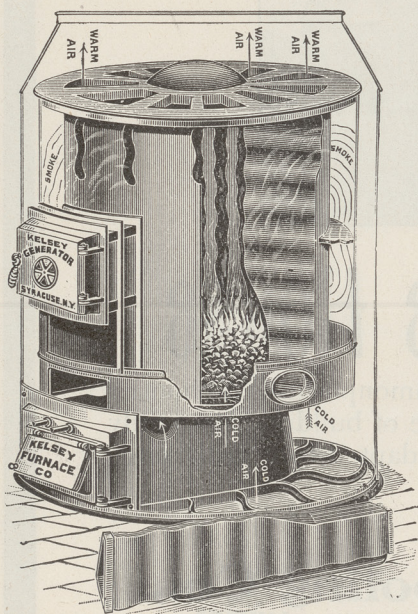
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